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# OREGON AGRICULTURAL COLLEGE BULLETIN

## BIENNIAL REPORT OF THE BOARD OF REGENTS 1914-1916

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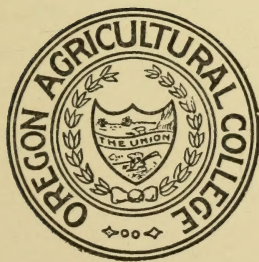




# OREGON AGRICULTURAL COLLEGE BULLETIN

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BIENNIAL REPORT  
OF THE  
BOARD OF REGENTS  
1914-1916



CORVALLIS  
COLLEGE PRINTING PLANT  
1917



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*Honorable James Withycombe,*  
*Governor of the State of Oregon.*  
*Sir:*

In accordance with the law, I herewith submit the report of the Board of Regents of the Oregon State Agricultural College for the biennial period ending December 31, 1916, including the report of the President of the College and the appended reports of the Treasurer and of the Director of the Experiment Station and other officers.

Respectfully submitted,

J. K. WEATHERFORD,  
President of the Board of Regents.

January, 1917.





# OREGON AGRICULTURAL COLLEGE

## PRESIDENT'S BIENNIAL REPORT

### 1914-1916

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To the Board of Regents:

The President of the College has the honor to submit to the Board of Regents his report for the year 1914-15 and 1915-16, together with a statement of the condition of the institution and estimates of its requirements for the next biennium. In previous biennial reports, particularly the reports for 1906-08, 1910-12, and 1912-14, there were considered at considerable length various questions relating to the purpose and scope of the College, its place in the educational system of the State, its policy, organization, and courses of study; the sources of income, and the relation of the College to the Federal Government and the State. For information upon any phase of these questions reference may be made to these different reports. Detailed information regarding student enrollment, College finances, and the work and needs of the Agricultural Experiment Station, the Extension Service, and the various schools and departments throughout the institution, may be found in the appended reports and in official College publications which are submitted as a part of this report.

#### STUDENTS

The total student enrollment in all courses for 1914-15 was 4,175; for 1915-16, 3,265. Of these, 1,628 were registered in the regular four- years courses during the year 1914-15, and 1,663 during the year 1915-16. Others, making up the total given for these years, represent those registered in the summer school and in the different short courses. For comparison, the following table is given showing the enrollment in resident courses through the past

six years, all duplicate names being excluded. Students in correspondence or extension itinerant courses are also excluded:

	Full Year	Short Courses	Grand Total
1910-11 .....	970	808	1,778
1911-12 .....	1,142	1,726	2,868
1912-13 .....	1,364	950	2,314
1913-14 .....	1,579	856	2,435
1914-15 .....	1,629	2,547	4,176
1915-16 .....	1,663	1,702	3,265

The distribution of students among the different courses is indicated in the following table, which, for purposes of comparison, covers the four years, 1912-13 to 1915-16:

	1912-13	1913-14	1914-15	1915-16
Agriculture .....	429	496	547	556
Forestry .....	51	81	83	76
Home Economics .....	270	326	371	354
Engineering and Industrial Arts.....	299	302	297	312
Commerce .....	143	160	169	177
Pharmacy .....	51	69	61	69
Optional .....	59	86	27	53
Music .....	62	59	73	66
	1,364	1,579	1,628	1,663
Summer School .....	98	187	208	237
Winter short courses .....	852	669	2,339	1,365
	2,314	2,435	4,175	3,265

As shown in the report of the Registrar, the student enrollment in the regular full-year courses during each year of the biennial period covered by this report represents every county in Oregon; and in the year 1914-15, 35 different states and 12 foreign countries; in 1915-16, 34 different states and 12 foreign countries.

During 1914-15 the number enrolled from Oregon was 1,190; from other states, 403; from foreign countries, 36, making a total of 1,629. The states with the largest representation were California, with 127; Washington, 106; Idaho, 32; Illinois, 14; Indiana and New York, 10 each. During the year 1915-16 the number enrolled from Oregon was 1,185; from other states, 441; from foreign countries, 37, making a total of 1,663. In that year the states with the largest representation were California, 135; Washington, 123; Idaho, 49; Illinois and New York, 11 each. Including summer-school and short-course students, the total enrollment from Oregon during the year 1915-16 was 2,683; from other states, 526; and from foreign countries, 56.

**Geographical  
Distribution.**



In 1914-15 the average age of students in the secondary or vocational courses was 20.5; in 1915-16, 20.7. The average age of students in the regular degree courses in 1914-15 was 19.8; in 1915-16, 22. The average age of the graduating class in 1915 was 24; in 1916, 23.

Age of  
Students.

In the regular four-years courses the enrollment of women increased during the four years, 1912 to 1916, from 416 to 493, or 18.5 percent. During the same period the enrollment of men increased from 948 to 1,086, or 14.3 percent. The ratio of men to women, not including those registered in the short courses and in the summer school, is more than two to one.

Ratio of Men  
to Women.

The number of students who entered from other institutions in 1914-15 was 61; in 1915-16, 76. During 1915-16 students transferred to this institution from 40 different colleges and universities and from five normal schools. Among the institutions represented in this list are included the University of California, University of Illinois, University of Michigan, Michigan Agricultural College, University of Minnesota, University of Oregon, University of Washington, Washington State College, Columbia University (N. Y.), Ohio State University, Pennsylvania State College.

Transfers  
From Other  
Institutions.

Complete lists of the graduating classes are given in the Registrar's report. The number for 1914-15 was 289; for 1915-16, 321.

A study of student statistics, as given in the different reports of the Registrar, reveals interesting facts, showing the growth of the College. For instance, the increase in student enrollment in all courses for the year 1915-16 over the year 1910-11 was 83 $\frac{1}{3}$  percent; the increase in the regular students pursuing full-year courses for the same period was 71 percent. Excluding vocational students and including only those pursuing regular college courses leading to degrees, the increase is 101 percent. Excluding students in the School of Music, which is self-supporting, the increase is 114 $\frac{1}{3}$  percent. The average increase in student enrollment for the five years is 27.86 percent.

College  
Growth.

## BUILDINGS

On account of shortage of funds, as explained elsewhere in this report, it has been impossible to provide the additional room required. No building operations were possible during 1915. By reducing other expenditures to a minimum, however, it was estimated at the time the last biennial report was prepared, that \$52,000 would be made available for building purposes during the year 1916. But the increase in cost of maintenance beyond what was contemplated at the time made even this impossible. Plans for the Forestry building were completed, however, and provision was made in the budget for 1916-17 to construct this building, the cost of which, when completed, will be approximately \$40,000. This building, described in the dean's report, is a substantial building, of concrete and brick, with stone trimmings, and contains the room required by the School of Forestry, including laboratories for the work in Logging Engineering.

Forestry  
Building  
Completed

At the time the Millage-Tax Law was passed, it was expected that the income under this law would be sufficient not only for the maintenance of the College, but for buildings and other improvements as well. As explained elsewhere, however, in this report, under College Finances, the reduction in the College income for Resident Instruction and the large increase in the requirements of the institution for general maintenance, including instructional staff, equipment, and miscellaneous improvements, make it impossible to provide funds from the millage tax income for building purposes. Indeed, only by the exercise of the most rigid economy can the expenditures for maintenance be kept within the available funds under this law. Any construction during the next biennium will have to be provided for by special legislative appropriations.

Millage Tax  
Sufficient for  
Maintenance Only.

To relieve the congested condition that now obtains generally throughout the institution and that will be intensified during each of the years of the approaching biennium, it is imperative that additional room be provided at once.

After most careful consideration it has been determined that the greatest relief can be secured, if only one building be possible, through the construction of the Library building. As explained

in the reports for the past three or four bienniums, the College has for many years been greatly in need of a Library building. The books of the Library, now aggregating in value some \$110,000, are stored in six different class rooms, on two different floors, of the old Administration building. These rooms are not only entirely inadequate, but are also in every way unsuitable. There is practically no protection against loss from fire. The reading room, moreover, has a normal capacity of only 107 readers, to accommodate a college community numbering nearly two thousand! There is no way by which this situation can be improved except by the construction of a Library building.

Preliminary plans for the Library building have been prepared by the architects, and the cost, including the expense of making connection with the heating plant and the water and sewer systems, is estimated at \$100,000. The building will be approximately 140 x 110 feet, three stories in height, constructed of reinforced concrete and brick, with stone trimmings. It will contain the stack-room, reading room, repair and binding rooms, catalogue room, and other work rooms and offices needed in library work; and also a number of study and lecture rooms and seminars that may be used temporarily by the School of Home Economics and two or three of the service departments. The removal of the library from the Administration building would vacate seven rooms that could be used in relieving the congestion in engineering, physics, and other departments.

### COLLEGE FINANCES

The appended report of the College Treasurer gives an account in detail of the receipts and expenditures during the biennium. The report for Resident Instruction and the Home Experiment Station is for the two years, July 1, 1912, to June 30, 1914, and for the Branch Experiment Stations and the Extension Service, for the calendar years 1913 and 1914. Since each of the three main divisions of the work of the College—Resident Instruction, Agricultural Experimental and Research Work, and the Extension Service—is financed entirely independently of the other two, separate reports are submitted of the receipts and expenditures for each of these divisions.



A complete outline statement was given in the last biennial report of the various sources of College income, including the Acts of Congress and of the State Legislature providing for the support of different divisions of College work and the amounts received under each. It is not deemed necessary that this statement be repeated in the present report.

Sources of  
Income.

As a matter of understanding, however, attention should be called to the fact that no part of the appropriations provided for one division of College work can be utilized in support of another. Appropriations for the Branch Experiment Station work, for instance, cannot be used, directly or indirectly, for work at the College. The same is true of funds provided for different phases of the Extension Service. All the work of Resident Instruction, of the Agricultural Experimental Station, and of the Extension Service must be paid from funds provided respectively for these divisions. In cases where the time of members of the staff is divided between the work of any two of these divisions, their salaries are adjusted accordingly. Some members of the staff, for example, divide their time between the Experiment Station and Resident Instruction, or between Resident Instruction and the Extension Service, but only the actual time devoted to the work of each division can be paid for from the funds provided for that division.

Appropriations  
Not Inter-  
changeable.

In the report of the President for the biennium 1912-14, reference is made to the passage by the State Legislature of laws providing a permanent income for the support of the College, including the mill-tax levy for Resident Instruction and continuing annual appropriations for the Extension Service and the Agricultural Experiment Station. The importance of these legislative enactments in providing for the financial support of the College was emphasized as placing the institution in a position to devote its energies uninterruptedly to positive, constructive effort, thereby insuring the most economic expenditure of its funds and the attainment of the highest degree of efficiency.

Ideal of Efficiency  
Through Perma-  
nent Income.

That the developments of the immediate future rendered impracticable the realization of this ideal is shown by the following facts:

The Millage-Tax Law, passed by the State Legislature in 1913, provided a tax levy of  $\frac{1}{16}$  of a mill on each dollar's valuation of State property for the support of Resident Instruction, including maintenance and the development of the College plant.

This law was to become operative January 1, 1915. It was estimated by the State Tax Commission, based on the experiences of recent years, that when the law should go into effect the tax valuation of State property would approximate one billion dollars, and that such valuation would increase at the rate of about four percent annually thereafter.

At the time this law was passed, there was a continuing appropriation for maintenance of \$200,000 a year, with special appropriations for the years 1913-14 for equipment, library, building improvements, repairs, etc., of \$255,500. The law providing the \$200,000 annual maintenance appropriation was repealed, to take effect April 1, 1915. This continued the

Decrease of  
Income Under  
Millage Tax, 1915. appropriation over the first quarter of that year, thus making available \$50,000, which, as contemplated at the time, would be used in providing certain additional room very much needed but for which, in addition to the cost of maintenance, equipment, and other improvements, the millage-tax income would not be adequate. All the plans for the work throughout the institution and for the development of the College plant, beginning January 1, 1915, were based upon the income as thus estimated. On account of the depreciation in the valuation of State property, however, instead of an increase, there has been a large decrease in College income below the amounts estimated at the time the Millage-Tax Law was passed.

The following table shows the estimated income under the Millage-Tax Law during the two bienniums 1915 to 1918, the actual income being given for the years 1915 and 1916, and the amounts estimated for the years 1917 and 1918, on the assumption that the valuation during the next two years will remain as at present; the table shows also the difference between the estimated income and the actual income for each of these years.

Decrease for  
Years 1915  
to 1918.



	Estimated income	Actual income	Difference
1915 .....	\$450,000*	\$329,686**	\$120,314
1916 .....	420,000	373,798	46,202
Amount received less than estimated for the two years ..			\$166,516
1917 .....	\$441,000	\$351,501	\$ 89,499
1918 .....	463,050	351,501	111,549
Total difference for the biennium 1917-18.....			\$201,048

From the above it will be observed that the income of the College for the years 1915 to 1918, inclusive, on the basis of the millage-tax income for Resident Instruction, including buildings and other improvements, will have been \$367,564 less than was estimated for these purposes at the time of the passage of the Millage-Tax Law.

On the other hand, there has been a large increase in student enrollment, and in the resultant demand for additional room, equipment, and other facilities. According to statistics furnished by the Registrar, the average increase in the number of students in the regular four-years courses during the years 1910-11 to 1916-17, estimating the total enrollment for the present year, has been 16 percent. Including the regular degree-course students only, the increase during the five years, 1910-11 to 1915-16, is 114 $\frac{1}{3}$  percent, or an average of 22.86 percent. The increase in income for Resident Instruction during the same period is 67.4 percent, or an average over the five years of 13.5 percent.

The great advance, moreover, particularly during the last year, in the price of materials used by the College has caused an unusual relative increase in the amount required for current expenses. For instance, the fuel-oil contract expired during the past year. Under the new contract, the best that could be obtained, the cost of fuel oil was increased 47 $\frac{1}{2}$  percent. This item alone adds to the maintenance cost during the present year \$4,600. This is only an illustration. The cost of many other materials has increased from 20 percent to more than 100 percent. It has been

\*This amount includes the \$50,000 during the first quarter under the continuing appropriation measure mentioned in the context, and \$400,000 millage-tax levy.

\*\*Three-fourths millage-tax income amounting to \$279,686, plus the \$50,000 mentioned in the above note. By a ruling of the Attorney General the income under the Millage-Tax Law did not become available until April 1, 1915, instead of January 1 as originally contemplated.

necessary, also, to increase the salaries of members of the faculty on account of increase in cost of living and the higher salaries offered by similar institutions in other states. To retain our best and most capable specialists a further increase will be necessary during the next two years.

The financial situation, and the economy practised by the College, may be further illustrated by reference to the cost per student. With allowance for slight variations in the cost of certain materials in different states, the cost per student in the same courses in similar institutions should be approximately the same. During the past two years the cost per student in the regular degree courses at the Oregon State Agricultural College has been from \$70 to as much as \$200 less than that in a number of other land-grant institutions of similar rank. The same will be true during the next two years. According to the report of the United States Commissioner of Education, the cost at this institution is \$125 less than the average in the colleges and universities of the United States. Using the minimum difference of \$70, the income of the College during the next two years would be increased by more than \$200,000.

The immediate effect of the Millage-Tax Law in the development of the College plant is shown by the fact that during the years immediately preceding the passage of this law, the funds provided by the Legislature for buildings, equipment, and permanent improvements were, for 1909-10, \$210,000; 1911-12, \$273,500; 1913-14, \$249,000, or a total during six years of \$732,500, not including \$15,500 special appropriations provided for street improvements. For buildings alone the average was more than \$127,000 for each biennium; whereas, under the Millage-Tax Law, as explained on another page, no funds whatever were available for buildings during 1915, and only about \$40,000 during the year 1916.

The following statement shows the estimated income from all sources for Resident Instruction for the fiscal years 1917 and 1918, including salaries, care and heating of buildings, light and

power, publications, repairs, equipment, library books and periodicals, and permanent improvements, such as new buildings, construction of drives, walks, etc.:

From the State of Oregon—		1917	1918
Millage tax .....		\$351,501*	\$351,501
From the Federal Government—			
Morrill and Nelson funds .....	\$50,000		
Interest land-grant fund, Act 1862.....	11,500	61,500	61,500
Miscellaneous**—			
Student entrance fees, including regular, winter, and summer courses, diploma fees, and net sales.....		12,000	12,000
		<u>\$425,001</u>	<u>\$425,001</u>

\*On the basis of 4/10 of one mill on valuation taxable property announced by State Tax Commission, December, 1916, \$878,753.144. The estimated income for 1918 is on the basis of the same valuation for that year.

\*\*The income listed above does not include receipts of dormitories and self-supporting farm departments, nor student laboratory and shop fees used to cover cost of material used by students in shop and laboratory work, as they do not constitute an institutional resource and are not available for the support of the institution.

It will be observed that the estimated receipts for each of the years 1917 and 1918 are less by nearly \$22,000 than the income for the preceding year, 1916, and are only \$23,000 more than for 1915.

The following is a summary of the estimated requirements for the biennium 1917-1918, based on the actual expenditures for 1916. Information more in detail will be found in the appendices.

1. Salaries—	1917	1918
Present salaries as of November 1, 1916.....	\$261,907	\$261,907
Estimated additional salaries .....	17,185	24,500
Increase in salaries, estimated 5%.....	13,000	13,950
	<u>\$292,092</u>	<u>\$300,357</u>
2. General Maintenance—		
Including care of buildings, heating, light and power, water, publications, etc., but excluding shop and laboratory student supplies* .....	74,000	75,000

\*Cost of supplies required in laboratory, shop, and other departmental work is not included here for the reason that these supplies are paid for from student fees not included in the statement of estimated income.

3. College Exchange**	4,175	4,175
4. Repairs—		
Including necessary repairs to buildings, painting and refinishing floors, repairing plaster, renewing doors and windows, painting and repairing roofs, downspouts, etc.	10,312	10,312
5. Equipment—		
Including scientific apparatus, livestock, machinery, desks, cases, and miscellaneous articles of furniture	15,614	15,614
6. Library—		
Including library books and periodicals and binding	4,000	4,000
7. Fire Protection—		
Including fire escapes, hydrants, chemicals, etc.	4,000	.....
8. Improvements—		
Including finishing of unfinished rooms in Men's Gymnasium, converting rooms in Science Hall formerly used by School of Forestry into chemical laboratories, improving walks, drives, etc.	9,279	3,745
9. Miscellaneous—		
Departmental and miscellaneous repairs and improvements	1,500	1,000
10. Farm Maintenance—		
Including maintenance of farms, barns, and livestock	7,000	7,000
11. Emergency Balance	3,029	3,798
	<hr/> \$425,001	<hr/> \$425,001

It will be observed from the foregoing that provision is made for an increase in salaries amounting, in the aggregate, to approximately five percent. Of this amount, between four and five thousand dollars will be required in a readjustment of salaries of instructors. For example, a substitute teacher in Zoology is receiving \$1,000 a year, whereas the regular instructor who has been on leave of absence two years doing advanced work will return at the beginning of next year, at a minimum regular salary of \$1,400; a graduate of the College is serving as assistant in one of the departments during the present year, at a salary of \$750, but if continued another year will require a minimum salary of \$1,100,

Necessary  
Increase in  
Salaries

\*\*The College Exchange is a service department handling practically all the stenographic work for the School of Agriculture, Experiment Station, and Extension Division. The Exchange has charge of the mailing of all publications of the School of Agriculture, the Experiment Station, and Extension Division. The cost of maintenance is prorated among the funds for the three divisions of the institution's work, which for the year 1916 is as follows: Resident Instruction, \$3,675; Experiment Station, \$1,100; Extension, \$6,735.



and so on. No general increase in salaries is contemplated. The salaries paid by the Oregon State Agricultural College, particularly to those occupying the more responsible positions, are much lower than in similar institutions in other states. Some increase in salaries is imperative, otherwise people whom the College can least afford to lose will be induced by higher salaries to accept positions in other institutions. The College has lost a number of its most capable professors and instructors during the past two years because of its inability to pay the salaries required to hold them.

The continued rapid growth of the College and the corresponding increase in the amount of work required in different departments make it necessary that a number of additional instructors be employed. The estimates by the deans and heads of departments of the increase in instructional force for the next biennium are nearly double the amount here requested as approved by the Board of Regents.

The department estimates of the equipment required average, for the biennium, between fifty and sixty thousand dollars a year. All of the equipment listed is needed and should be provided, if possible, but in order that the expenditures in the aggregate might be brought within the income, it has been deemed necessary that these estimates should be further reduced to the amounts given.

The budget allowance for library books and periodicals also is reduced from \$15,000, the amount provided for the last two years, to only \$8,000 for the biennium, an amount really inadequate for a single year.

An institution as large as the Oregon State Agricultural College should have an emergency balance amounting to at least \$10,000 a year. An increase in enrollment above what is estimated would necessitate the employment, as during the present year, for instance, of additional instructors. And other emergencies are likely to arise from time to time, making unavoidable the expenditure of amounts not given in the regular budget. The amounts listed in the budget for 1917 and 1918 for contingencies are therefore the



minimum. They should, in fact, be much larger. It will be noted, furthermore, that no allowance is made in the budget for new buildings.

Reference has already been made to the necessity of an appropriation from the State Legislature of \$100,000 for a Library building. The fact is also stated, in that connection, that this is the least with which the institution can get along without seriously impairing the efficiency of the work. The fact is that there are many other things which are badly needed and which should be provided as soon as practicable. These include an auditorium, engineering laboratories, an additional unit of the Home Economics building, a veterinary hospital, a special building for work with horticultural by-products, and a number of small but comparatively inexpensive farm buildings, such as a calf barn, a seed- and feed-storage building, a horse barn, a machine shed. A men's dormitory while not actually required in the work of the institution, would be very helpful in reducing the student cost of living. There is great need, also, for additional farm land; at present the College is renting 350 acres for the use of the farm departments. Finally there is need for additional equipment for different departments and for various improvements throughout the institution not provided for in the budget allowances for the next two years.

**Needs for  
Buildings and  
Equipment.**

## EXPERIMENT STATION

Special attention is called to the report of the Director of the Agricultural Experiment Station. The importance of the work of the Station in the development of the agricultural interests of the State can hardly be over-estimated. The work of the members of the Station staff has been of exceptional value in surmounting the difficulties encountered by the farmers and fruit-growers. The special annual appropriations provided by the State Legislature in 1911 resulted in a large extension of the Station work. The value of the work already accomplished has been such that publications have been in large demand throughout Oregon and have also been called for by specialists in different lines of agricultural work in other states.

**Constructive  
Work Being  
Done.**

Just as the organization was entirely complete and the Station was in a position to proceed most successfully with its work, the Legislature of 1915 repealed the appropriation acts of 1911, and left the Station with no support except the appropriations received from the Federal Government. As a result, it was necessary to discontinue the services of nine members of the staff, to abandon a number of important lines of investigation, and to reduce the other work in different departments of the Station, and also the amount of field work in different sections of the State. As a brief summary of the situation, and by way of emphasis, the following is quoted from the report of the Director:

Withdrawal  
of Funds Para-  
lyzes Work.

"As a State, Oregon is very largely dependent for continued prosperity upon the development of her Agricultural resources. In area greater than New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York New Jersey and Delaware, Oregon, owing to varied topography, soils, and climate, presents a greater diversity in the factors which influence agricultural production than are to be found in all that portion of the United States east of the Mississippi and north of the Ohio River; and the problems which need to be solved are correspondingly varied and numerous.

"Yet in the eight states named above, there are ten Experiment Stations with combined Federal and State appropriations for agricultural investigations aggregating approximately \$500,000; while in Oregon, with her greater area and greater diversity of conditions, and with agriculture a relatively much larger factor in her development, the total Federal, State, and County appropriations for the Experiment Station are less than \$69,000, of which Federal sources provide \$31,000, Hood River County \$2,000, and the State but \$28,000, all of which is for Branch Stations."

It is urged that the State Legislature at its next session restore the appropriations for agricultural investigational work by the re-enactment of the laws repealed in 1915. These are the minimum amounts with which the Station can meet the requirements of the State for crop-pest and agricultural scientific investigational work.

Legislature Urged  
to Restore  
Appropriation.

## EXTENSION SERVICE

The work of the Extension Service is fully outlined in the appended report of the Director. Special attention is called to the recommendation that the Extension Law, which was passed by the State Legislature in 1913, but which was repealed by the legislature in 1915, should be re-enacted. This would make possible a large increase in the amount of money provided by the

U. S. Department of Agriculture for cooperative extension work in Oregon. It would also have the effect of allowing the necessary appropriation to meet the requirements of the Federal Government under the Smith-Lever Act. Even should it be deemed inexpedient at this time to remove the limitation of \$15,000 placed on the amount the State may appropriate to duplicate appropriations by the U. S. Department of Agriculture, provision should be made, at least, for a duplication of the Federal Smith-Lever funds. For the years 1917 and 1918 these amounts would be \$11,856 and \$15,562, respectively.

Respectfully submitted,

W. J. KERR,  
President.





## REPORT OF THE SCHOOL OF AGRICULTURE

To the President of the College,

Sir: I have the honor to submit the Biennial Report of the School of Agriculture and Experiment Station for the years 1914-15 and 1915-16.

The School of Agriculture includes fourteen departments of instruction; namely, Agricultural Chemistry, Animal Husbandry, Bacteriology, Botany and Plant Pathology, Dairy Husbandry, Drainage and Irrigation, Entomology, Farm Crops, Farm Mechanics, Horticulture, Poultry Husbandry, Soils and Farm Management, Veterinary Medicine and Zoology; the College Exchange; the College farms, orchards, creamery, etc.; the Central Experiment Station; and seven Branch Experiment Stations.

The staff numbers one hundred and three persons, including the Dean and Director, fifteen professors, six associate professors, eleven assistant professors, fourteen instructors, twelve assistants and fellows, seven superintendents, fourteen clerks and stenographers, and twenty-four other employees, including assistant superintendents, foremen, and others on regular salary.

The work of all departments may be classified under three general heads; namely, resident instruction, experiment station, and extension. Some of the faculty members are engaged wholly in the work of resident instruction, some wholly in experiment station work, while most of them do some extension work. Based upon the ratio which that portion of the salaries paid the departmental faculties for instruction bears to their total salary, there is available for the work of actual instruction during 1916-17 the equivalent of the full time of 25.4 persons.

**Student Enrollment.** Although our student entrance requirements have increased during the biennium to the full four years high school course, the number of full year students in Agriculture has continued to increase. The average increase for each of the two years over the corresponding year of the preceding biennium has been nineteen and one-half percent. The number enrolled for the year 1915-16 was over 1,350, including 30 graduate students, 110 seniors, 70 juniors, 112 sophomores, 133 freshmen, 41 vocational, and over 800 short course students. All students, moreover, in the schools of Home Economics and Forestry, and the course in Pharmacy pursue one or more courses in the departments of Bacteriology, Botany, and Zoology.

During the ten years from 1906-07 to 1915-16, the number of Agricultural students, exclusive of Short Course students, has increased from 80 to 566, as shown in the following table:

	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
Long Crs.	80	109	187	218	237	303	429	496	547	566
Short Crs.	56	70	130	420	407	1432	1057	919	1405*	733*
Faculty	8	14	19	22	25	28	30	44	48	52

\* Men only.

The development of the School during the past two years, however, has been marked not so much by increased attendance as by improvement in the grade of work done. A more mature and better prepared class of students, the passing of the period of changing entrance requirements, together with somewhat better facilities, has enabled the faculty as a rule to place our instructional work on a plane not surpassed, I believe, by that of any similar institution.

**Courses of Study.** In accord with the announcement in my last report, one-year vocational courses were substituted for the secondary course in Agriculture at the beginning of the 1914-15 school year. The degree courses were also revised at that time to conform to the new entrance requirements which went into effect at the beginning of the 1915-16 school year.

The vocational courses have proved to be less popular than was anticipated. The total enrollment in these courses for 1914-15 was only 63, and for 1915-16 only 41 persons. The general satisfaction, however, expressed by both instructors and pupils with the grade of work done by these classes, is encouraging. The value of the courses to young men, who for any reason cannot pursue the degree courses, is so evident that I believe they should be continued and that a more systematic effort should be made to bring them to the attention of such men.

The revised degree courses which were announced in my last report have proved so satisfactory that only minor changes have been made in them, and these have had to do with the organization of the work rather than with its nature. For instance, a few departmental courses have been added, and experience having indicated that the requirements for graduation were too narrowly specialized to meet the needs of some students, especially those who transfer to this institution from other colleges and universities, provision has been made whereby students who prefer not to specialize may, with the approval of the Dean, pursue a course in General Agriculture, with a wide range of electives.

The various departments offer courses of instruction in 287 different subjects, aggregating 820 semester credits. This is an increase during the biennium of 25% in the number of courses, and 23% in the credits offered.

**Graduates.** What becomes of Agricultural graduates? Sufficient information is not available at this time to enable me to give a definite and complete answer, although an effort is being made to get it. Between June 30 and September 30, 27 Horticultural graduates accepted positions with salaries from five or six hundred to twenty-five hundred dollars a year. Of all who have graduated in Agronomy during the past eight years there have been only two who wished to secure positions who did not do so, and most of those taking positions have advanced rapidly. Of the class of 1916 a number have been already placed, three as county agriculturalists in other states, Washington, Wyoming, and New Hampshire, at beginning salaries of \$1,500 to \$1,800. The 1916 graduating class in Dairy Husbandry numbered 16. There were also two who took

their Master's degree, several special students, and twelve vocational students in Dairying, yet there were more positions than men available.

A very large proportion of our graduates, however, do not care for salaried positions. They prefer to return to the farm. This is shown clearly by the following interesting and instructive report by Professor Potter on the present occupations of the graduates and special students in Animal Husbandry:

"During the eight years the writer has been connected with the department of Animal Husbandry of the Oregon Agricultural College, 53 men have graduated from the department. Of this number, 50 are now farming on the home farm, either by purchase or lease, or working in partnership with their fathers. Fifty-seven percent of our graduates are therefore back on the old farm place. Students of agricultural conditions everywhere maintain that the greatest problem confronting American agriculture today is that of keeping the farm boys at home on the farm instead of allowing them to drift to the city. When, therefore, we put 57% of our graduates back on the home farm, it would seem that we are doing very well. Of the 23 who did not go back to the home farm, 17 had no farm to which they could go, while the other six found the old home farm so completely occupied by other members of the family, that it could support no more.

"Six of our graduates are salaried farm managers in various parts of the West, adopting in this way the next best thing to going back to a home farm, that is, running some one else's farm or ranch for a salary, although the salaries in many cases include a percentage of the proceeds or profits.

"Five are engaged in miscellaneous farm and live-stock work. These are largely men who graduated without sufficient practical experience to justify their holding responsible positions, and they are, therefore, at present working in subordinate positions until they have gained the age and experience necessary to a full managership. Five are in salaried agricultural positions, such as county agriculturists, extension workers, and similar occupations. It is interesting to note that the salary of these graduates is in practically all cases larger than that received by the instructors in our department of Animal Husbandry at the same age, and with the same experience. Two of our graduates are now in Eastern institutions taking advanced work in animal husbandry. Two have drifted out of touch with the department, and at present their occupations are unknown. Three and only three have gone into other pursuits than agriculture. All of these three men were graduated several years ago when the courses were just as much general as agricultural, but even then they were largely forced into other pursuits by circumstances other than their own inclination or training. These three graduates are practically the only graduates at the present time who could really be designated as residents of town rather than of country, although the five engaged in salaried agricultural positions do hold their legal residence in some town, while their work is practically all in the country. Any suggestion, therefore, that an agricultural college training, particularly one in Animal Husbandry, has any tendency toward sending the students away from the farm is plainly contradicted by these figures.

"In addition to our graduates a large number of other men who did not complete their entire course, but who took special work, are now on the farms raising live stock and making a splendid success. They are a credit to the department, the institution, and the State.

"It should be borne in mind that none of these men have been out of school for a longer period than seven years, and that practically all of them are today less than thirty years of age. To expect these boys to



distinguish themselves in this short time would seem to demand a good deal, yet we have no difficulty whatever, in finding plenty of them who have achieved notable success."

Professor Potter then reviews the careers of seven or eight young men whose achievements as farmers, breeders of live stock, and dealers and shippers of cattle, have won not only conspicuous attention for success in business, but also for exemplary service to their communities through constructive ideas. A few of these men had no taste for regular school and college courses, and did not graduate; but Professor Potter points out that their work at the College was far from wasted. In conclusion, he says:

"It must not be understood that this department makes a specialty of students who fail in other courses, but we do realize that the students who fail in general high school and college work are of two very distinct classes. The one who can not tell "the difference between water and H<sub>2</sub>O" because his mind is full of lesser things; cigarettes, pool, base ball scores and tango. With the other the formulae are also crowded out, but by bigger things; the raising of cattle, hogs, and horses; the building of roads and bridges; irrigating deserts, draining swamps, restoring the fertility of worked-out soils, developing water powers, conserving our resources. It is the young man who is interested in the real affairs of the world that we are training along lines that will be of direct value to him later in life."

**Personnel.** Since a complete list of the staff of the School of Agriculture is included with the members of the College faculty listed elsewhere in this publication, the names are not listed in the report of this School. Resignations in the staff which have occurred since July 1, 1914, are given below:

#### **Resignations.**

- H. S. Jackson, Professor of Botany and Plant Pathology, resigned to accept a similar position at Purdue University, at increased salary.
- H. F. Wilson, Professor of Entomology, resigned to become Professor of Entomology at the University of Wisconsin at 50% increase in salary.
- L. H. Lindgren, Superintendent John Jacob Astor Branch Experiment Station, resigned to enter the Federal Service, at 50% increase in salary.
- G. H. Roberts, Superintendent John Jacob Astor Branch Experiment Station, resigned to engage in farming.
- C. C. Starring, Horticulturist Hood River Branch Experiment Station, resigned to accept a position with the Montana Experiment Station at an increased salary.
- J. R. Winston, Plant Pathologist Hood River Branch Experiment Station, resigned to enter U. S. Bureau of Plant Industry at an increase in salary.
- M. M. McCool, Assistant Professor of Soils, resigned to become Professor of Soils at Michigan Agricultural College at 25% increase in salary.



- A. G. Lunn, Assistant Professor of Poultry Husbandry, resigned to become Extension Specialist in Poultry Husbandry at the Massachusetts Agricultural College, at an increased salary.
- F. L. Griffin, Professor of Agricultural Education, resigned to accept a position in the department of Education at Cornell University, at 50% increase in salary.
- G. H. Godfrey, Research Assistant in Plant Pathology, resigned to accept a position with the U. S. Bureau of Plant Industry.
- A. F. Vass, Assistant Professor of Bacteriology, Research, dropped from staff on account of repeal of Experiment Station funds.
- F. R. Brown, Research Assistant in Horticulture, dropped from staff on account of repeal of Experiment Station funds.
- L. R. Childs, Research Assistant in Entomology, dropped from staff on account of repeal of Experiment Station funds.
- G. F. Moznette, Research Assistant in Entomology, dropped from staff on account of repeal of Experiment Station funds.
- R. F. Beard, Research Assistant in Chemistry, two-fifths of his time transferred to instructional work on account of repeal of Experiment Station funds.
- J. R. Magness, Research Fellow in Horticulture, dropped from staff on account of repeal of Experiment Station funds; reappointed to succeed Professor Kraus, who is on leave of absence.
- A. F. Barss, Research Fellow in Horticulture, dropped from staff on account of repeal of Experiment Station funds; reappointed to succeed Professor Kraus, who is on leave of absence.
- Miss Clara Nixon, Research Fellow in Agricultural Chemistry and Poultry Husbandry, dropped from staff on account of repeal of Experiment Station funds.
- Mr. G. B. Posey, Research Fellow in Plant Pathology, dropped from staff on account of repeal of Experiment Station funds; reappointed following resignation of Professor Jackson. Later resigned to accept position in the U. S. Bureau of Plant Industry at an increased salary.
- Mr. J. H. Corsaut, Research Fellow in Plant Pathology, dropped from staff on account of repeal of Experiment Station funds.
- F. D. Bailey, Research Assistant in Plant Pathology, resigned to engage in farming.
- H. M. Carnes, Vetch Expert of Experiment Station in cooperation with U. S. Department of Agriculture, resigned to engage in farming.
- E. R. Stockwell, Instructor in Dairying, resigned to engage in farming.
- E. M. D. Bracker, Instructor in Farm Mechanics, resigned to engage in farming.
- G. D. Horton, Instructor in Bacteriology, resigned to become Bacteriologist in charge of Poultry Disease Investigations, Missouri Experiment Station.

W. P. Tufts, Instructor in Horticulture, resigned to accept a similar position at the University of California, at an increased salary.

R. A. Marshall, Instructor in Horticulture, resigned to accept a position at the Virginia Experiment Station, at 33 1-3% increased salary.

I. H. Blake, Instructor in Zoology, resigned to accept a similar position at Massachusetts Agricultural College.

Mrs. Elizabeth Cole-Sykes, Instructor in Zoology.

H. M. Middlekauf, Research Fellow in Bacteriology, resigned to accept a Fellowship in Bacteriology at the Iowa State College.

J. H. Martin, Fellow in Agronomy, resigned to take position in Federal Service.

C. M. Scherer, Teaching Fellow in Botany, completed work for Master's degree.

G. K. Van Gundia, Teaching Fellow in Botany, completed work for Master's degree.

H. W. Hyland, Teaching Fellow in Zoology, completed work for Master's degree.

C. E. Schuster, Teaching Fellow in Horticulture, completed work for Master's degree.

G. L. Philp, Research Fellow in Horticulture, completed work for Master's degree.

C. S. Brewster, Foreman Poultry Plant, resigned to enter Cornell University for graduate study.

C. E. Robinson, Animal Husbandry Foreman, resigned to engage in farming.

R. M. Rutledge, Secretary to Dean and Director, resigned to take up graduate work at University of Wisconsin.

H. A. Vickers, Stenographer in Department of Horticulture, resigned to become Secretary of Extension Division, O. A. C.

Mabel Turlay, Stenographer in Department of Agronomy, resigned to become Secretary to the Dean of Women.

A number of resignations have also occurred in the Staff of the College Exchange.

Although changes in minor positions may reasonably be expected, the above list of resignations is altogether too long. All instructors and assistants can not be promoted, and realizing this they naturally seek more responsible positions elsewhere. Frequent changes in the heads of departments, and other responsible positions, however, are to be deplored. A professor of Plant Pathology, Farm Crops, or Drainage and Irrigation, for instance, must not only be capable and well trained, but he must also know local conditions and problems. Thus his efficiency and value to the State increase with length of service. Experience has shown that with our schedule of salaries, there is great danger of losing our most capable men just as they approach the period of maximum efficiency. Oregon needs the services of the best men, and adequate provision should be made to retain them.

**Increased Facilities.** While none of the much-needed buildings has been provided for the work in Agriculture during the biennium, the facilities for instructional work have been, nevertheless, materially increased. A thirty-five-acre instructional orchard has been planted; small foundation herds of Guernseys and Herefords have been provided and our flocks and herds have also been materially augmented by purchase and by natural increase; the creamery and the cheese factory have been more completely equipped and placed upon a cooperative basis, thus enabling the patrons to get the entire returns from the sale of butter and cheese, less the cost of manufacturing, and giving to the students actual experience in a small commercial creamery and cheese factory; a laboratory for Veterinary Medicine has been equipped; approximately 365 acres of land have been rented for the use of the departments of Animal Husbandry, Dairy Husbandry, and Farm Crops, and some additional equipment has been provided for most of the laboratories.

**Agricultural Chemistry.** The instructional work in Agricultural Chemistry is given in the unaffiliated department of Chemistry, and the report upon it will be found in the report of that department.

**Animal Husbandry.** The department of Animal Husbandry has made satisfactory progress during the biennium. By utilizing every resource to the utmost, it has, during this time, I believe, taken its place among the leading animal husbandry departments of the country. Professor Potter reports that

"Extensive borrowing from the neighboring breeders, accompanied by the natural increase of our own herds and flocks, and the purchase in 1914 of a small herd of Hereford cattle, has enabled us to supply our students with good stock for the instructional work, with the exception of horses, in which case our judging classes are badly handicapped for the lack of proper material.

"The efficiency of the farm operations of this department has been greatly increased during the biennium by two things. First, a small portion of the College farm has been set aside for the exclusive use of the department, and entirely under its control. This land has been fenced and seeded in such a manner as to take care of the live stock much better than before. Second, the department has been authorized to lease additional land for a five-year period, instead of year-by-year. This has enabled the department to seed clover and grass, and thus get more and better pasture and forage than was possible with land rented for one year.

"The instructional work has been very much improved by the perfecting of an organization, whereby each member of the force has a separate line of work, in which he is expected to be the final authority. This organization has proved ideal from the standpoint of getting the most efficient work throughout the department. The perfecting of the department budget system, as applied to College and Experiment Station work, has enabled the department to use its limited funds with far greater efficiency than before."

**Bacteriology.** The comparison between the work of the department of Bacteriology in the College years 1911-12, and 1915-16, shows that the amount of instructional work, measured in student hours, has increased in five years, for the first semester,  $5\frac{1}{2}$  times, and for the second semes-



ter, 2 1/3 times. The amount of instructional time, however, available for this increased work is slightly less than 1 1/4 times what it was in 1911-12. It should also be noticed that there has been practically no increase in the equipment of the department during the biennium.

**Botany and Plant Pathology.** "Some of the activities of the teaching staff of this department," reports Professor Barss, head of the department, "may be cited as illustrative of the many demands which are made upon the various departments of the School of Agriculture. In addition to a heavy teaching schedule, and the administrative work incident thereto, the members of the staff are constantly called upon for services outside of the regular instruction; services which the College is in duty bound to perform, but which occupy a great deal of time aside from the ordinary teaching. Each member of the staff contributes his share to the Winter Short Course work and the lectures of the Farmers' and Home-Makers' Week. One or more of the members are also occupied in the Summer School courses. A brief list of some of the other work being contributed by the departmental force is as follows: A study of the physiological principles underlying the keeping qualities of fruit. A carefully prepared and illustrated set of articles for the Oregon Teachers' Monthly on Oregon trees. This material will be useful later in bulletin form. A study of poisonous plants of Oregon and their distribution, answering the large correspondence on this subject. A study of range plants, and the succession of plants on natural and seeded pastures of value to stockmen and dairymen. Identification of grasses, and correspondence incident thereto.

"Investigation of diseases of forest trees of importance to the lumber industry. The establishment of a museum of plant diseases, a most valuable aid to efficient instruction. Collection of plant disease specimens, which are distributed to high schools, etc., for public use.

"A much needed weed survey of the State. Identification of thousands of native plants and weeds. Answering of a large and increasing correspondence regarding native plants and weeds, drug plants, etc. Collection and care of additions to department herbarium."

**Dairy Husbandry.** An especial effort has been made during the biennium to improve the facilities and to raise the standard of work in Dairy Production and in Dairy Manufacturing. Something of the progress made is indicated by the following extracts from a report by Professor Graves:

"In the spring of 1913 the College dairy herd was made up of one Holstein Friesian cow, 12 Jersey cows, 3 Ayreshire cows, and a few heifers.

"The average production of the herd for the year 1912 was as follows:

	Milk	Fat
Average production, 12 Jerseys .....	4,661.1	244.8
Average production, 3 Ayreshires ....	6,457.0	246.0
Average production, 2 Holsteins.....	8,311.0	281.6
Average production, 17 cows in heard	5,407.0	232.7

"The greater part of the old Jersey and Holstein herd was sold during 1913 and new foundation herds purchased. During 1915, 11 Jerseys, 4 Holsteins, and 8 Ayreshires were in milk and their average production was as follows:

	Milk	Fat
Average production, 11 Jerseys.....	6,769	341.29
Average production, 4 Holsteins .....	11,384	399.83
Average production, 8 Ayreshires....	7,891	318.59
Average production, 23 cows in heard	7,961	343.58



"From 1904 to 1913 the best record made in the College herd was by Lady Glencoe, a Holstein, with 15,201 pounds of milk and 477.48 pounds fat, though the best showing was made by the Jersey cow, Cynthia, with an average production for the six consecutive years of 359.43 pounds butter fat. In 1914 the Jersey cow, Eva's Eva, set a new record for the herd by producing 9,931.5 pounds milk containing 589.86 pounds fat. This year the Jersey cow, Old Man's Darling, will hang up another record for the herd by producing close to 800 pounds of butter fat. Whereas up to 1914 not one cow in the College herd had produced 500 pounds of fat in one year, this year, 1917, seven cows in the College herd will exceed that amount.

"The College herd now includes a small foundation herd of Guernseys and some 25 heifers of the various breeds. It is expected that these heifers will greatly increase the average production of the College herd as they are richly bred along production lines.

"A farm of 140 acres is gradually being put under cultivation by the Dairy department for the support of the herd.

"Previous to 1913, the College had no commercial creamery in which to instruct students majoring in Dairy Manufacturing. A commercial creamery was started in the fall of 1913. In 1915 the Creamery was put on a cooperative basis, the farmers getting the entire returns from the sale of the butter and cheese over the actual cost of operation and upkeep. This method has resulted in a rapid increase in the out-put of the creamery and is stimulating a greater interest in dairying among the farmers of the community. The Creamery will manufacture some 70,000 pounds of butter and 40,000 pounds of cheese during 1916. The increased out-put is offering excellent facilities for training students in manufacturing work.

"The Dairy department has had a marked increase in the number of students majoring in its work as is shown by the number of seniors graduating from its four-years courses. In 1913 the department had one senior graduate; in 1915 eighteen men graduated; in 1916 sixteen men graduated, and in addition there were two Master's degree men, several special students and about twelve vocational men. Each year the department has had a strong demand for well-trained men. This demand is increasing and this year there were more positions than men available."

**Drainage and Irrigation.** The work in Drainage and Irrigation has been hitherto included in the department of Agronomy. The great importance of the subject in this State, the increased demand from farmers and others for information relative to drainage and the more efficient and economical use of water in irrigation, and finally, the increase in the amount of instruction, seemed to justify the organization of the separate department of Irrigation and Drainage under Professor Powers. Something of the progress of the work and its importance are indicated in the following extracts from reports by Professor Powers:

"The relative importance of drainage and irrigation in the development of this State may be seen by the fact that the area of improved lands in farms as given by the last census was 4,273,803 acres, whereas the acreage capable of irrigation was 830,526, although 2,527,208 acres were included in irrigation projects. The area reclaimable by drainage is still larger. There are a half million acres of marsh land in Oregon and a total of some 2,000,000 acres of wet land that would be greatly improved by drainage. An increased production of \$10 per acre due to drainage of this large area would add \$30,000,000 to our annual agricultural out-put.

"If reclamation projects are to pay for rather costly developments, great care must be given to the location of tile, the distribution of water on the farm in order to secure the most profitable returns for each unit of irrigation water or the greatest efficiency per hundred feet of tile employed.

"Oregon was perhaps the first State to offer a course in irrigation farming. Two years ago a major course in this subject was introduced, and class instruction added in Irrigation Institutions, Irrigation Field Practice, and Irrigation Investigations. The drainage work has been correspondingly large. At the present time thirteen courses are being offered, requiring sixteen class sections, with a total enrollment of 114 units for the year just closed. It is proposed to offer a new course in Irrigation Management next year.

"The instructional work now requires six hours in the lecture room, and twenty hours of laboratory work each week for the first semester, and nine hours are required for lecture and sixteen for laboratory during the second semester. There is an increasing interest in the work of this department, and there would be a still greater demand if the department were properly equipped. The work is relatively new, and would increase 50% during the next two years."

**Entomology.** The repeal of the Experiment Station appropriation made it necessary to drop two assistants from the staff of this department on July 1, 1915. Shortly afterward the Head of the Department resigned to accept a similar position at the University of Wisconsin. The period covered by this report, therefore, has been one of retrenchment and reorganization. The close of the biennium finds the new organization and the new policies fairly well established, and the work of the department making satisfactory progress. The instructional work, particularly, is showing a marked development. A constantly increasing number of students are enrolling both for regular courses and for advanced work. During the past year 156 students have carried work in 13 courses, totaling 42 credits. The course in Beekeeping, in particular, has become very popular among regular students, as are also the courses given during Farmers' Week and during the regular Winter Short Course. Farmers and fruit growers from all over the State show a live interest in this subject and look to this department for assistance.

**Farm Crops.** The instructional work in Farm Crops has been given during the biennium as a part of the work of the department of Agronomy and has progressed satisfactorily. More than 400 students were enrolled in the under-graduate classes during the last year of the biennium, an increase of 10% over the previous year. Seven students pursued graduate work toward the Master's degree. Just at the close of the biennium the work in Farm Crops was organized into a separate department, with Associate Professor G. R. Hyslop in charge.

**Farm Mechanics.** Like the work in Farm Crops, that in Farm Mechanics has been given during the biennium as a part of the work in the department of Agronomy, but has recently been organized into a separate department, with Assistant Professor J. W. Gilmore in charge. The work of the department is housed in a separate building and is all that could be expected and desired under present conditions. During the past year

there has been available for the instructional work of the department farm machinery valued at more than \$15,000, which has been loaned to us by the various dealers in farm machinery. This courtesy is very much appreciated by the College authorities, not only because of the saving in College funds, but more particularly because of the fact that the various companies, by frequent changes, are enabled to keep the equipment strictly up-to-date. The instructional work, which includes exercises in the adjustment and operation of practically all classes of farm machinery, including gas engines and tractors, is becoming increasingly popular with our students, more than 175 of whom were registered in the various courses during the past year.

**Horticulture.** The instructional, as well as the research work in Horticulture has developed to a degree that has not only been of great economic value to the State and the Pacific Northwest but has become recognized as of constructive importance to the horticultural interests of the entire country and to the cause of science everywhere. Instruction and investigation in pruning, in loganberry by-products, in the use of sulfur as an orchard and legume fertilizer, in walnut culture, in the rejuvenation of declining orchards, in cherry pollination, and in greenhouse investigations and the culture of broccoli, have all brought tangible results of great moment to horticulture. The department could make still larger use of its scientific resources if it had additional buildings and equipment, such as a by-products building and greenhouse facilities, and an additional instructor.

**Poultry Husbandry.** The facilities and equipment for instructional work have been improved during the biennium, and a two-credit course in Practical Poultry Keeping has been included as a requirement for all sophomore students in Agriculture, thus materially increasing the instructional work of the department. The demand for graduates of the department, to superintend extensive poultry plants and to organize and conduct the instructional and experimental work in poultry husbandry at other colleges and experiment stations, has followed the sustained success of the department's breeding experiments for the production of a high annual average of eggs. Results of the department's campaign for better poultry, started at the College eight years ago, have been manifesting themselves more decisively during the past biennium than ever before. Largely as a result of the department's teaching and its tangible aid in the dissemination of improved breeding stock, the production of poultry products in Oregon has grown in the past eight years from four million to eight million dollars worth. Experiments in selection and breeding of Barred Rocks increased the average production of the College flock from 84.7 eggs for each hen in 1908 to 176.5 eggs for each hen six years later. A cross between Barred Rocks and Leghorns developed, in the same length of time, a flock averaging 223 eggs for each hen. In all the egg-laying contests of the past two years, where the College had flocks entered in competition, the average production of the College entries outstripped all competitors. The College was first



also to make an authenticated 300-egg record in one year and a 1000-egg record in a little more than five years. Instruction embodying the practices and principles that made these records possible is having its effect in improving the poultry interests of the entire State.

**Soils and Farm Management.** The instructional work of the present department of Soils and Farm Management was a part, during the past biennium, of the work of the department of Agronomy. Since the department was abolished and the work reorganized at the end of the year, it seems only proper to include here some statements regarding the work of the general department. The chief items in this development have been summarized by Professor Scudder as follows:

"1. The number of courses offered increased 46% over the previous biennium, and the number of courses actually given increased 43%.

"2. Eighty-eight per cent of the courses offered are given on the average with almost no variation from year to year, notwithstanding the increase in the last biennium of 46% in number of courses offered.

"3. The increase in the demands for Agronomy work and in the amount of work given in answer to that demand, is shown by the fact that during the biennium, the number of credits of work given increased by 25%; the number of sections by 41%; and the number of students taught by 25%. Thirty seniors and eleven graduate students took major work in the department during the year 1915-16.

"4. All the instructional work of the department during the biennium has been handled by the part time of six instructors, amounting to the full time of four instructors, an increase of one-half time of one instructor over the previous biennium. A comparison of the number of instructors with the number of courses, credits, sections, and students, indicates the efficiency of the staff and the organization, particularly when the character of the work is considered. . . . The chief expenditures for equipment during the past biennium have been for a new Farm Crops laboratory, which has been excellently equipped with desks, plumbing, storage cases, and apparatus. Other expenditures have been made in rounding out the equipment of the Farm Mechanics section with lockers, tools, testing devices, etc.

"A good deal of time has been given by the department to the preparation of an exhibit of the dry-farming experimental work of this institution at the International Dry-Farming Congress at Wichita, Kansas, in 1914, and at Denver in 1915. Great interest was shown in these exhibits, especially in the dry-farm legumes and fertility rotation work, and the dry-farm management plan based thereon, which this Station is the first in the country successfully to develop.

"Altogether the department of Agronomy as an organization has so well completed its work that there is no longer any need for it as an organization. Following the history of every department of agronomy in nearly every institution of this kind in the country, (Cornell, Wisconsin, Missouri, Ohio, Washington, Michigan, California, Nebraska, Kansas, etc.), the department here is, and has been, ready for the segregation of its several sections into individual departments for more than a year past. Under date of January 5, 1916, I so reported to the Dean, giving reasons therefore, and recommending a plan of segregation which was approved and adopted in full, to go into effect July 1st. . . . This plan provides for the complete segregation of the department of Farm Mechanics, Drainage and Irrigation, and Farm Crops as independent departments with their respective specialists in charge. The work in Soils and Farm Management was retained by myself, as that in which I am most interested, and which still is in need of the greatest development."



**Veterinary Medicine.** The instructional work in Veterinary Medicine has made remarkable progress in spite of a lack of facilities which would have utterly discouraged anyone less optimistic than Dr. Simras. With practically no laboratory facilities for the work in Anatomy or for clinics, the work of the department has nevertheless met with the hearty favor of students and of other departments related to it. No attempt is made to prepare students for professional work in Veterinary Medicine. The work is given rather for the benefit of students in Animal Husbandry and in Dairy Husbandry, and is intended to teach students to recognize disease, treat emergency cases, diagnose and control outbreaks of disease, and take care of sick animals.

**Zoology and Physiology.** The department of Zoology is one of the large service departments of the institution, many of the courses being arranged especially to meet the needs of the schools of Home Economics and Forestry and the course in Pharmacy. The enrollment of students increased from 75 in 1910-11 to 409 in 1914-15, but decreased to 301 in 1915-16. In addition to conducting the class work in some twenty-five courses of study, the various members of the staff are engaged in the study of numerous economic problems, among which may be mentioned Causes of Mortality of Salmon Fry at State Hatcheries; the Spawning Age of Salmon; the Circuli of Scales as a Means of Determining the Age of Pacific Coast Salmon; Adaptability of Streams about Corvallis to Hatchery Purposes; Aquatic Fauna of Oak Creek as Related to Fish Food; Jackrabbit Control; Methods of Controlling Gophers, Squirrels, and other Rodents.

**The College Exchange.** The College Exchange, which was organized two years ago to serve as a central clerical and mailing office for the School of Agriculture, has amply demonstrated its efficiency. The correspondence, aggregating more than 20,000 letters, the large amount of general office work, and the mailing of an average of more than 1,000 pieces a day, has all been handled expeditiously and economically.

**Instructor in Drainage and Irrigation Needed.** The instructional requirements in the department of Drainage and Irrigation for the present year total thirteen hours for the first semester and twenty hours for the second semester. Owing to the rapidly increasing interest in drainage and irrigation, Professor Powers' services are in demand for work away from the institution perhaps as often as are those of any other member of the faculty. It is inadvisable, therefore, for him to devote more than three-fourths of his time to instructional work, and consequently some provision should be made for caring for this work when he is necessarily absent from College. It is recommended that an Instructor in Drainage and Irrigation be employed at a salary of \$1,400 a year.

**Instructor in Farm Crops Needed.** Because of the importance of the subject, the increased amount of work given, the steadily increasing number of students and their ability to handle more work; because of the ever-present desirability of improving the work in so important a sub-

ject and the large amount of Extension and Experiment Station work which of necessity must be done by a department of farm crops, it is recommended that an Instructor in Farm Crops be engaged at a salary of \$1,400 a year.

**Instructor in Horticultural By-Products.** The employment of an instructor who shall be a specialist in Horticultural By-Products is recommended, provided it is found to be feasible to erect the By-Products building mentioned below.

**Teaching Fellow in Bacteriology.** The teaching requirements for the department of Bacteriology this year total 47½ hours for the first semester and 41 hours for the second semester. Professor Beckwith estimates that the increase for next year will amount to 24 hours the first semester and 16 hours for the second semester, and he requests an additional assistant at \$1,400 a year. In view of the fact that Professor Beckwith will probably be relieved of certain duties by the establishment of the Health Service for the College, I believe that the work of the department can be conducted satisfactorily with the addition of a Teaching Fellow to the present staff, at a salary of \$500 a year.

**Assistant in Animal Husbandry Needed.** An assistant in Animal Husbandry is needed to care for the larger part of the routine work of the department, thus saving the time of the better-trained and higher-salaried men for the actual work of instruction and research. I am convinced that the employment of such an assistant at \$900 a year is in the interest of real economy and efficiency. I therefore recommend it. I also recommend that an allowance of \$300 for additional instructional assistance be made.

**Horse Barn Needed.** It is recommended that a Horse Barn be erected at an approximate cost of \$10,000. The erection of this barn would relieve the most urgent needs of three departments and would make possible some very desirable improvements.

A. It would provide convenient facilities for the care of all our horses.

B. In the loft abundant room could be provided for the storage, drying and handling of all seeds, grains, etc., for the department of Farm Crops; thus relieving the institution, for several years to come, of the necessity of building a Seed Barn.

C. By the removal of the horses and the seed room from the Dairy Barn, sufficient additional room would become available to meet the present needs of the Dairy department.

**Veterinary Building Needed.** A Veterinary Building should be provided as soon as possible. Satisfactory work in this important subject cannot be given until adequate provision is made for more clinics. This building should include an anatomical and post-mortem laboratory, where dissections and post-mortem work can be given; a clinical and operating room, where all classes of clinical and surgical work can be demonstrated; stables for the isolation of contagious cases, etc. The character of the

work precludes the use of other buildings for veterinary purposes, thus making it necessary to provide a special building. This can be erected at an estimated cost of \$8,000 to \$10,000.

**By-Products Building Needed.** There is much interest in the Pacific Northwest in the question of horticultural by-products. The Horticultural Division reports that a heavy correspondence relating to this phase of horticulture is being received, and that some students are already pursuing work along this line. Many industries succeed in proportion to the profit which may be realized from their respective by-products, and I feel that this institution could be of great service to the horticultural interests of the State were we to make provision for research work and courses of instruction relating to the various horticultural by-products. The utilization of culls and other waste products will become more and more important with the development of the industry. If this research and instructional work is to be undertaken, a By-Products Building of considerable size, but not necessarily expensive, will be required. Fifteen thousand dollars would probably suffice to provide both building and equipment. There is no doubt that the great value of the work to the fruit industry of the State would abundantly justify the expenditure.

**Sheep Barn Needed.** The rapid development of our herds and flocks makes the erection of a sheep barn in the near future a necessity. Estimated cost \$3,000.

**Greenhouses Needed.** In my last report I emphasized the need of better greenhouse facilities for the departments of Horticulture, Agronomy, Botany, and Entomology. The development of the work of these departments results in this need becoming more and more urgent. Plans have been prepared for a modern plant to replace the old one at a cost of approximately \$35,000. If this cannot all be provided at the present time, I would respectfully urge that one section be erected, at an approximate cost of \$3,500. For both the instructional and the experimental work in Soil Fertility, Soil Physics, Cereal Crops, Agrostology, Crop Breeding, Irrigation Farming, Dry Farming, etc., a greenhouse is indispensable for the best work. This is especially true of the work in Soil Fertility.

**Machinery Sheds Needed.** The present facilities for storing and caring for farm machinery are entirely inadequate and unsatisfactory. It is recommended that the old barn be torn down as soon as practicable, and that a plain, serviceable, and adequate machinery shed should be erected on its site.

## THE EXPERIMENT STATION

From the standpoint of the Experiment Station, the last biennium has been a period of retrenchment in expenditures and of curtailment of work.

The Legislature, at its 1915 session, by enactment of the law "to repeal all continuous, annual, and standing appropriations," deprived the Oregon Experiment Station of all State support other than a few small appro-



priations for Branch Stations. The specific measures which were repealed are as follows:

"Chapter 144, General Laws of Oregon for 1911, appropriating \$15,000 annually for State Agricultural College, investigation of fruit pests and diseases and horticultural problems."

"Chapter 230, General Laws of Oregon for 1911, appropriating \$10,000 annually for State Agricultural College for Experiment Station at Corvallis."

"Section 15 of Chapter 280, General Laws for Oregon for 1913, appropriating \$1,000 annually for State Agricultural College for examining and testing seeds."

While the amount withheld from the Experiment Station by the repeal of these laws, was small in comparison to the sums appropriated by other states no more opulent than Oregon and with less complicated problems to solve, yet the loss of these sums was damaging to the work of the Station. The loss made it necessary to dispense with the services of nine members of the staff (see list of resignations, page 9); to abandon entirely several important lines of investigation, some of which had been under way for several years; materially to reduce the other work in Bacteriology, Chemistry, Entomology, Horticulture, and Plant Pathology; to reduce the amount of field work in other parts of the State than those in close proximity to Corvallis, on account of lack of funds with which to pay traveling expenses; to limit the number of bulletins published, and to restrict the editions of those published within such limits as to make it impossible to reach all the people interested in the investigations.

As a State, Oregon is very largely dependent for continued prosperity upon the development of her Agricultural resources. In area greater than New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Delaware, Oregon, owing to varied topography, soils, and climate, presents a greater diversity in the factors which influence agricultural production than are to be found in all that portion of the United States east of the Mississippi and north of the Ohio River; and the problems which need to be solved are correspondingly varied and numerous.

Yet in the nine states named above, there are ten Experiment Stations with combined Federal and State appropriations for agricultural investigations aggregating approximately \$500,000; while in Oregon, with her greater area and greater diversity of conditions and with agriculture a relatively much larger factor in her development, the total Federal, State, and County appropriations for the Experiment Station are less than \$69,000, of which Federal sources provide \$31,200; Hood River County \$2,000; and the State but \$28,000, all of which is for Branch Stations. Possibly the support which the East gives to Agricultural investigation has something to do with her rapid agricultural development during the last decade.

The necessity of additional investigation of problems in all branches of Agriculture is so evident and urgent, and the benefits to be derived by



the State are so important, that I feel justified in recommending that the Legislature be urged to enact a measure similar to Chapter 230, General Laws of Oregon for 1911, but carrying an appropriation for the Experiment Station at least equal to the total of the three which were repealed; viz., \$26,000. In addition, provision should also be made in the law for the automatic duplication by the State of all allowances which may be made by the Federal Department of Agriculture for investigational work in the State in cooperation with the Oregon Experiment Station.

The importance of this provision is indicated by the following facts:

(1) The Bureau of Soils of the Federal Department of Agriculture has each year for the past two years made tentative proposals for a co-operative study of the soils of some definite area in Oregon, but, having no available funds, we have been compelled to waive the opportunity.

(2) The Office of Irrigation Investigations of the Department of Agriculture has made already a tentative proposition to appropriate \$2,500 for duty of water investigations in the State next year, provided the Experiment Station will duplicate the amount. The fact that land is abundant while available water for irrigation is relatively scarce and the consequent necessity of making the most economical and efficient use of this water that is possible, makes this investigation of vital interest to Eastern Oregon, yet at present the Experiment Station has practically no funds which can be devoted to the work of investigation.

(3) The Cooperative Seed Testing Laboratory has been maintained during the past year wholly upon Federal funds, but with the expressed understanding that the agreement is not to extend beyond June 30, 1917, unless the State makes provision to share in the expense.

(4) Several small sums are at present being provided by the Department of Agriculture for cooperative work upon special problems, but in every instance the allowance has been made with the understanding that the Experiment Station shall share the expense at the earliest possible moment.

**Projects Under Experiment.** The extent and variety of the work of the Experiment Station and its direct bearing upon the agriculture of the State is indicated by the following list of projects that are now under investigation. To summarize the results of these investigations, even by departments, would require many pages of this report. The abstract of reports submitted by the departments, in the briefest form consistent with clearness and accuracy, required 140 pages of typewritten copy. Though it is manifestly unfair to make summaries of certain individual experiments while omitting all others, a brief statement of results already obtained in certain of the experiments, even though they are still in progress, may help to indicate the economic importance of the individual projects.

Experiments at the Southern Oregon Branch Station have shown that in the growing of legumes, notably alfalfa, sulfur is a fertilizer of great value, though until recently it was not regarded as a necessary

fertilizer at all. On the coarse granite soil south of Ashland the increase in the yield of alfalfa has varied from 85% in some cuttings to 121% in others. On the Salem clay loams sulfur produced an increase of 196% in 1915 and 304% in 1916. On the Antelope adobe, it produced an increase of 374% in 1915 and 1260% in 1916.

Experiments in drainage on the College farm, to determine the effects and value of tile drainage at different distances and depths on white soils, the cost and profits thereof, and the best cropping plan to follow subsequent to drainage, have already served as a safe guide in the development of drainage systems on hundreds of acres of Willamette Valley lands, and will continue to be of service as drainage operations are extended over the three million acres of land in this State lacking good natural drainage.

Experiments to find the cause and method of prevention of cherry gummosis, have resulted in determining that the disease is caused by bacteria, that certain cherry stocks, notably Mazzard, are resistant to the disease, and that methods of control and ultimate eradication may be hoped for as a result of investigations still under way.

Experiments in Hood River orchards have demonstrated that the essential element needed in the orchard soils of that valley is nitrogen, and that the careful use of this element as a fertilizer will greatly increase the yield of apple orchards.

Examples of this nature could be multiplied from the list of experiments that follows:

#### Department of Agricultural Chemistry—

- Project No. 3 (Adams) Hop Investigations.
- Project No. 9 ( " ) Incubator Investigations.
- Project No. 10 ( " ) Spray Investigations.
- Project No. 13 ( " ) Activities of Oregon Soil Bacteria.
- Project No. 1 (Hatch) Prune Standardization Investigations.
- Project No. 2 ( " ) Soil Analyses.
- Project No. 3 ( " ) Miscellaneous Chemical Problems.

#### Department of Animal Husbandry—

- Project No. 1 (Hatch) Cost of Pork Production.
- Project No. 2 ( " ) Value of Tankage as a Supplement for Green Feed in Feeding Hogs.
- Project No. 3 ( " ) Use of Self Feeder in Feeding Hogs.
- Project No. 4 ( " ) Wet vs. Dry Feed for Fattening Hogs.
- Project No. 5 ( " ) Wheat vs. Barley for Hog Fattening.
- Project No. 6 ( " ) Individual Variability in Fattening of Hogs.
- Project No. 7 ( " ) Influence of Breeding on Fattening Ability of Swine.
- Project No. 8 ( " ) Shelter for Sheep.
- Project No. 9 ( " ) Cost and Method of Raising Spring Lambs.

#### Department of Agronomy—

- Project No. 1 (Hatch) Soiling and Forage Crop Rotations and Sequences.
- Project No. 2 ( " ) Fertility Rotations.

- Project No. 3 ( " ) Fertilizer Trials.
- Project No. 4 ( " ) Land Clearing Investigations.
- Project No. 5 ( " ) Propagation and Maintenance of Alfalfa under Western Oregon Conditions.
- Project No. 6 ( " ) Soy Bean Trial.
- Project No. 7 ( " ) Corn Variety and Improvement Trials.
- Project No. 8 ( " ) Variety and Improvement Tests of Oats, Barleys, and Wheats.
- Project No. 9 ( " ) Kale Breeding Trial.
- Project No. 10 ( " ) Potato Varieties and Improvement.
- Project No. 11 ( " ) Flax Trial.
- Project No. 12 ( " ) Vetch Trial.
- Project No. 13 ( " ) Irrigation in the Willamette Valley.
- Project No. 14 ( " ) Land Drainage Trials.
- Project No. 15 ( " ) Hermiston Soil Survey.
- Project No. 16 ( " ) Pumice Land Investigations.
- Project No. 17 ( " ) Columbia Basin Dry Farming Investigations.
- Project No. 18 ( " ) Central Oregon Dry Farming Investigations.
- Project No. 19 ( " ) Lime Trials.

#### Department of Bacteriology—

- Project No. 1 ( Hatch ) The Effect of Soil Reactions and Soil Moisture on *B. radiculicola*.
- Project No. 2 ( " ) White Diarrhoea of Chicks.
- Project No. 13 ( Adams ) Soil Bacteriological Investigations.

#### Department of Botany and Plant Pathology—

- Project No. 8 ( Adams ) Cherry Tree Gummosis.
- Project No. 17 ( " ) Bacterial Blight of the Filbert.
- Project No. 1 ( Hatch ) Root Rots of Field Crops.
- Project No. 2 ( " ) Western Tomato Blight.
- Project No. 3 ( " ) Strawberry Diseases.
- Project No. 1 ( C. P. ) Potato Diseases.
- Project No. 2 ( " ) Rust of Pomaceous Fruits.
- Project No. 3 ( " ) Small Fruit Diseases.
- Project No. 4 ( " ) Brown Rot of Stone Fruits.
- Project No. 5 ( " ) A Study of Oregon Rusts.
- Project No. 6 ( " ) Bacterial Blight of the Filbert.

#### Department of Dairy Husbandry—

- Project No. 1 ( Hatch ) Steaming Chopped Hay for the Dairy Cow.
- Project No. 2 ( " ) Inheritance of Milk Production.
- Project No. 3 ( " ) Factors Controlling the Curd Content of Butter.
- Project No. 4 ( " ) The Loss of Fertilizing Constituents in Stored Manure.
- Project No. 5 ( " ) Kale vs. Corn Silage.
- Project No. 6 ( " ) The Relation of Conformation in Dairy Cow to Milk Production.
- Project No. 7 ( " ) The Value of Substitutes for Skim Milk in Feeding Calves.
- Project No. 8 ( " ) The Relation of the Working of Butter to the Retention of its Moisture Content.
- Project No. 9 ( " ) Replacing the Grain Ration with Alfalfa Molasses Meal.
- Project No. 10 ( " ) The Production of Clean Milk.



## Department of Entomology—

- Project No. 2 (Adams) Combination Sprays and Recent Insecticide Investigations.  
 Project No. 11 ( " ) A Study of Scolytididae Infesting Douglas Fir.  
 Project No. 16 ( " ) A Study of the Comparative Values of Little-Known Insecticides and a Comparative Study of the Powers of Resistance of Insects to Poisons.  
 Project No. 2 (Hatch) Codling Moth.

## Department of Horticulture—

- Project No. 4 (Adams) Pollination of the Apple.  
 Project No. 5 ( " ) Orchard Irrigation Investigations.  
 Project No. 14 ( " ) Pruning as a Factor in Bud Differentiation.  
 Project No. 15 ( " ) A Study of Critical Temperatures Relating to Fruit Production.  
 Project No. 1 (Hatch) Investigations to Determine the Best Prune Stock to Use under Various Soil Conditions.  
 Project No. 2 ( " ) Investigations to Determine Best Depth for Planting Young Trees.  
 Project No. 1 (C. P.) Influence of Fertilizer on Bitter Pit.  
 Project No. 2 ( " ) Orchard Management Investigations.  
 Project No. 3 ( " ) Prune Standardization.  
 Project No. 4 ( " ) Loganberry Pruning and Fertilizer Investigations.  
 Project No. 5 ( " ) Loganberry By-Products.  
 Project No. 6 ( " ) Pollination of Drupaceous Fruits.  
 Project No. 7 ( " ) Plant Breeding Investigations With Apples, Prunes, Cherries, Pears and Strawberries.  
 Project No. 8 ( " ) Onion Fertilizers.  
 Project No. 9 ( " ) Bean Studies.  
 Project No. 10 ( " ) Greenhouse Investigations with Tomatoes, Lettuce, etc.

## Department of Poultry Husbandry—

- Project No. 2 (Hatch) Poultry Breeding.  
 Project No. 9 (Adams) Incubation Investigations.

## Department of Veterinary Medicine—

- Project No. 1 (Hatch) Abortion and Sterility in Cattle.

## Hood River—

- Project No. 1 (Botany) A Study of Apple Winter Injury and Core Rot.  
 Project No. 2 ( " ) Mushroom Root Rot.  
 Project No. 3 ( " ) Apple Scab.

Respectfully submitted,

A. B. CORDLEY,

Dean of the School of Agriculture,  
 Director of the Experiment Station.



## REPORT OF THE EXTENSION SERVICE

To the President of the College,

Sir: I have the honor to submit herewith a report of the activities of the Extension Service of the College during the past Biennium, and a brief statement of plans for future development. A detailed report of 528 pages, covering all phases of Extension work, is on file in the Extension Office.

### ORGANIZATION AND JURISDICTION

The Regents authorized the organization of the College Extension Service in 1911, but want of funds made it impossible to put the organized plan of work into effect until July, 1913, when the State Extension law became operative. The activities of that year are recorded in the last Biennial Report. In 1914 Congress passed the Smith-Lever Bill, and so completed the legislation necessary to inaugurate an effective plan of Extension instruction supported by both the State and the Federal governments, and designed to provide instruction and assistance for the people of the state who are not in a position to benefit by the resident work of the Agricultural College.

Shortly after the passage of the Smith-Lever law the States Relations Service was organized within the United States Department of Agriculture, and given jurisdiction over all work done by the department in cooperation with the various Agricultural Colleges. The cooperative work within the State is, in turn, placed under the direction of the College Extension officers. This has brought to Oregon additional financial assistance, valuable information, aid in administration, and has resulted in greater economy and efficiency in the prosecution of Extension work.

The work in Agriculture and Home Economics is organized under the following thirteen projects, which have been approved by the United States Department of Agriculture:

1. Administration
2. County Agricultural Agents
3. Boys' and Girls' Club Work
4. Demonstrations and Instruction in Home Economics
5. Movable Schools and Farmers' Courses
6. Cooperative Dairy Work
7. Farm Management Demonstrations
8. Instruction by Correspondence
9. Bureau of Organization and Markets
10. Demonstrations by Means of Specialists
11. Pig Club Work
12. Press Bureau
13. Publications.

In addition to these formal projects, important service is being developed in Highway Construction, Engineering, Commerce, and in other fields of work.

At the close of the present year the Extension Staff consisted of thirty-three persons, devoting full time to the work, and twenty persons, spending from one-fourth to one-half of their time. Of the full-time employees, fourteen are county agents. In addition, there are many members of the Station and Resident Staff who devote from a few days to several weeks to Extension work during the year.

During the past two years much attention has been given to perfecting the organization of the Service so as to bring about the greatest possible economy and efficiency. The work of each member of the Staff has been outlined in detail at the beginning of each year, and detailed budgets prepared to cover cost of each line of work, so that every member of the Staff has had clearly in mind the conditions to be met, the results to be accomplished, the methods of procedure, the territory to be visited, and the cost of the work. In this manner, the most vital problems before the people of the State have been defined and the efforts of the Service have been centered upon their solution. This has resulted in more individual service, and work with smaller groups. Fewer people, comparatively, have been served, but the service has been of greater value because it has brought more definite results.

The following will serve as an illustration of the procedure above defined: A careful survey of conditions in the State showed that the drainage of wet lands was a matter of very great importance in the betterment of agriculture. About three million acres of land need draining. It is estimated that proper drainage will double the production. Consequently, a publicity campaign was started, which involved the circulation of news articles, bulletins, and letters, in order to arouse interest preliminary to the work that was to follow. In order to secure the cooperation and assistance of interested parties as early as possible in the campaign, a drainage association was organized. Following this, twenty-nine demonstrations were given in different sections where drainage was important, reaching 576 farmers. Meetings were arranged, and the subject was discussed before 4,485 interested persons. Forty-five trips were made to farms to help the farmers install drainage systems, and at the same time demonstrate the procedure to neighbors who were interested. In this manner 127 farmers received detailed instructions and direct help. Thus 5188 people were helped directly during the year. Direct aid has been given in the drainage of 2000 acres of land. Approximately 150,000 feet of under drain has been designed and levels given. In addition to this, outlet systems have been planned for over 12,000 acres. The interest is growing and the results of the work are multiplying rapidly. One tile factory reports that more activity has occurred in the tile business the past year than in the previous two years combined and that the last six months have been better than the whole previous year. It would be conservative to say

that every acre of land thoroughly drained, is advanced in value \$50.00 and that the outlet ditches will enhance the value of land at least \$25.00 an acre. This would mean that the value of drainage work directly effected by the work of the College representatives, would have a value of over \$400,000 to the State. This drainage campaign will be continued until the problem is solved.

This procedure has been adopted as the permanent policy of the Extension Service and is operating as vigorously and with equally gratifying results in practically all branches of the Service.

Within the past year the office work has been reorganized, dictaphones have been installed, a new filing system is being introduced, with the result that the capacity of the office has been increased by at least twenty-five percent.

### GENERAL STATEMENT OF WORK OF PAST BIENNIUM

**Publications.** During the year 1914-15 thirty-nine bulletins and circulars were issued with a total of 175,000 copies. During the year 1915-16, twelve publications of 194 pages were issued with a total of 110,500 copies. During the last year, there were also nine reprints of Extension bulletins of a total of 55 pages and a total of 29,000 copies printed. A series of small circulars giving plans for rural buildings of all descriptions, have been inaugurated. The work is being done by L. E. Robinson, Assistant Professor of Rural Architecture at the College. During the past year, blue prints and specifications for a dairy barn and silo were prepared and circulated.

**Chart and Lantern Slide Service.** The Extension Service in cooperation with the International Harvester Company has established a service whereby charts and lantern slides and accompanying lecture outlines may be obtained by the citizens of the State. These charts and lantern slides include various subjects in the field of agriculture and home economics.

**Demonstration Train.** A special fruit and vegetable canning demonstration train was operated in cooperation with the Southern Pacific Railway Company during two weeks of July, 1915. Thirty-one demonstrations were made in twenty-five different towns in the Willamette Valley which were attended by 3,200 people.

**Special Lecture Courses.** During the past year, two special courses were presented in Portland. One series was in the form of technical lectures in engineering, before the International Union of Steam and Operating Engineers, and the other a series of lectures for janitors, arranged at the particular request of the Portland school authorities.

**Fruit Marketing Campaign.** During the month of June, the Extension Service, in cooperation with the Federal Office of Markets and the Portland Chamber of Commerce, carried on a special campaign to present to Oregon communities the government plan of organization under the Growers' Agency, Inc., and to assist such communities as desire to receive the benefits of this Agency to organize for that purpose. The



itinerary covered practically every point in the State where the tonnage of fruit was sufficient to justify the organization of the growers under the government plan. As a result of the campaign, practically all fruit centers having sufficient tonnage, are planning to join the agency.

**Fairs.** Members of the Extension Staff assisted in judging 84 fairs during the past two years. Wherever possible, lectures and demonstrations were given in connection with the judging work.

Educational exhibits were maintained at the State Fair in Salem, the Manufacturers' and Land Products Show in Portland, and the National Apple Show in Spokane, and extensive exhibits were made at the Panama Exposition.

**Lectures.** While the Extension Service found it impossible to care for all of the requests received for lectures, 1213 were answered and 130,872 people were reached in this way. These lectures covered practically every line of work taken up by the Agricultural College.

**Movable Schools.** Thirty-eight movable schools were held by the Service during the past two years. These schools lasted from three to five days and had a total of 26,196 people in attendance. In most of the schools both agriculture and home economics were represented. In order to determine whether or not the work of these schools was of value to the people of the several communities, circular letters were sent to all who had enrolled. The returns indicated that the instruction offered was being followed and that results were of material benefit to the people who were following them.

**Farmers' and Homemakers' Conference Week.** Two years ago the annual Farmers' Week program was placed under the jurisdiction of the Extension Service. The work was reorganized and new features added. The principal change was in the form of conferences organized for the consideration of some of the problems that had developed during the past year and that needed organized effort in their solution. A number of the farmers' organizations also scheduled their session during the Farmers' Week at the College. The sessions were so well attended that it was necessary to choose a time when College was not regularly in operation in order to accommodate the visitors. During the two years 3938 citizens of Oregon, both men and women, came to these sessions to discuss their problems and to receive instruction and inspiration.

**Correspondence Courses.** At the beginning of this fiscal year three correspondence courses were offered by the Extension Service. The preliminary arrangements have been completed for sixteen additional courses making a complete list of nineteen as follows: Farm Accounting; Rural Law; Rural Economics; Advertising and Selling; Cooperative Accounting and Management; Business Organization and Management; Business Management for Women; Business Law; Bookkeeping; Accounting; Farm Arithmetic; Gas Engines; Concrete Construction on the Farm; Shop Arithmetic; Shop Drawing; Electricity and Magnetism and Its Mechanical Transformation; Farm Irrigation and Farm Drainage.



## COUNTY AGENT WORK

At the close of the last biennium twelve counties had employed county agents. Since that time two of these counties, Harney and Marion, have discontinued the work, and four new counties, Multnomah, Yamhill, Wasco and Josephine have introduced the work. The work in Harney county was discontinued in order to economize in the expenditure of county funds and because the commissioners felt that much of the service could be continued through the Branch Experiment Station until conditions warranted the reestablishment of the county agent work. In Marion county the work was never regularly established. It was originally supported by joint subscription from the Salem Chamber of Commerce and the U. S. Department of Agriculture.

The first part of the biennium was necessarily given over principally to campaigning for new territory and in getting the various county men started in their work. Since January of the present year special attention has been given to the organization of the work within the counties. This has consisted principally of three divisions; viz.,

First, the building up of organizations in each of the counties for the support of the county agent work. A council made up of successful farmers of the county has been provided for and is being organized as rapidly as possible, representing the farmers' organizations in the several counties. This council assists in the direction and prosecution of the work. It is proving a strong factor in the development of the service.

The second matter to receive emphasis is that of placing county agent work upon a definite project basis. This is done for the purpose of having the needs of the county clearly defined and the efforts of the county agent organized and brought to bear definitely upon the solution of these problems. The county agents have all outlined their projects for the year and are working toward their solutions. This has made it possible for the various members of the Extension Staff to harmonize their project work with that of the county and so bring the entire strength of the Extension Service to bear on those problems which most need attention.

The third step in the perfection of the county agent service has been the introduction of more effective publicity methods. By this is meant the use of publicity machinery for the purpose of getting information out to the people of the county. It is manifestly impossible for the county agent to call personally upon all the farmers often enough to give them the best of service. The next best thing seems to be an arrangement by which he may multiply his services to the individual farmers. When he finds something of general value, he is able through the use of the press, circular letters, and other publicity agencies, to get the information to hundreds of farmers who are in a position to profit by it.

**Nature and Results of County Agent Service.** It is manifestly impossible to give in this limited report anything that will indicate the

scope and value of the county agent work. A few excerpts are taken from the reports of the county men to illustrate a few of the things that have been done in the various counties.

In Crook county over 65,000 jackrabbits were killed through the organized work of the community clubs under the direction of the county agent and a representative of the U. S. Department of Agriculture.

The Deschutes Valley Potato Growers' Association was organized by the county agent late in the winter of 1915. The concrete results of this organization up to date are represented by the sale of four carloads of fancy potatoes in Sacramento for \$1600. These were grown by ten growers of the district. The purchasers were well pleased, they made an offer of a blanket contract for the total output at the highest market price.

The successful reorganization and supervision of five Cow Testing Associations represents one of the biggest projects and the most successful accomplishments in Coos county. The cheese manufacturers of Coos and Curry counties also were organized and incorporated into an association for the purpose of standardizing, inspecting, and grading the cheese output of these counties in the same manner in which the cheese of Tillamook county is now sold. The organization was perfected too late in the season to handle this year's output but the machinery is in existence and ready to perform important service another year. A bull association was organized and six registered Jersey bulls were imported. This will have a far-reaching effect in helping to improve the dairy stock of this section.

The county agent in Jackson county has saved the people of that section many thousands of dollars in helping them to determine the exact time at which it became necessary to smudge in order to protect the orchards from frost. Another example of the service in this section is in connection with fighting the codling moth. This insect in its various stages of development, is watched under screened traps and the community is informed as to the most effective time for spraying for control.

In Lane county, the agent has been devoting a good deal of attention to the marketing problem. With the assistance of the county agent, a public market is now in operation in Eugene and a system of cooperative hog shipping has been carried on there since October, 1915. An average of something like a carload of hogs has been shipped out each week since the work started.

The following summary of the work done by the twelve county agents for the year 1915 gives another viewpoint of this service. During the year 7613 farmers called at the agents' offices; 321 meetings were held, with an attendance of 35,637 persons. Three hundred forty-six articles on agriculture were prepared for the press; 25,465 letters were written. These figures represent only a few of the things which make constant claims upon the time of the county men.

While the results of county agent work up this time have been very satisfactory, everything considered, there is every reason to believe that the returns will be many times greater in the future. The better organization of the work, the broader experience of the men, the wider sympathy and understanding on the part of the farmers in the various counties, and the better insight into the work on the part of supervising officials will all contribute to the very great improvement of the service.

#### BOYS' AND GIRLS' CLUB WORK

The same policy of centering efforts and attempting to get definite results which has characterized the past year's work in other branches of the Extension Service, has also been applied to the Boys' and Girls' Club Work. Special attention has been given to the selection and instruction of local leaders who are to have immediate charge of the various clubs. The organizers have also attempted to enroll only those boys and girls who seem to have an opportunity of carrying the work to completion. This has resulted in much more thorough work and in a much lessened mortality in the enrollment.

As soon as the young people are enrolled and the club leader is satisfied that conditions are favorable for satisfactory work, the young people are sent instructions and bulletins giving helpful information. Lesson leaflets are distributed from time to time as reports from the members indicate their progress. In addition to this the members of the staff have spent a great amount of time in making personal visits to the clubs and to the individual members at their homes. This has had a far-reaching result. It not only encourages the young people but it has helped to attract the attention of the parents to some of the improved methods which are being introduced.

**Enrollment.** A total of 13,805 boys and girls have been enrolled in the club work this year. The enrollment by project is as follows:

Corn Growing, 929; Potato Growing, 788; Gardening, 2,432; Canning, 865; Poultry Raising, 1,192; Pig Raising, 463; Baking, 2,010; Sewing, 3,761; Handicraft Work, 945; Dairy Herd Record Keeping, 162; Seed Grain Selection, 106; Fruit Growing, 41; Rural Home Beautification, 92; Agricultural Advanced Work, 19.

**Results of Club Work.** It is difficult to give a clear idea of the full significance of this work but it is safe to say that it is carrying wholesome interests and useful instruction into thousands of homes of the State, instilling proper ideals and giving skillful training to thousands of young people, besides enlisting the interest of many adults. An enrollment blank was recently received from New Pine Creek in Lake county, containing names of twenty-four adult ladies who wished to take advantage of the lessons.

A few instances will illustrate something of the significance of the work. One Club girl, fourteen years of age, has made her own clothing for the past two years, is this year doing sewing for other people and



acting as an advisor for a sewing club of some twenty girls. Of the two thousand and ten members of the Baking Project, many of the girls are doing all of the baking for the home. The girls in the Canning Work are putting up from twenty to five hundred quarts of fruits and vegetables each and learning the best methods of canning. In many communities this has meant that the waste products have been saved and in many households it has meant a great reduction in the cost of food for the family.

The Corn Club members are required to raise at least one-eighth of an acre of corn and many of them are raising much more. A citizen near Hillsboro, who is familiar with the work of the Club boys in that section, stated that he considered the Club boys had increased the corn crop of several sections in Washington county by at least twenty-five percent. A Potato Club boy in Polk county has a patch of potatoes next to that of his uncle and the boy's crop is at least fifty percent better. This work is having a far-reaching effect with the farmers of that section. The Pig Club boys are attracting the attention of breeders and business men all over the State. Bankers are loaning money to the young men in order that they may get into the project. The boys are importing pure-bred stock and almost without exception are showing a good margin of profit on their undertaking.

The county school superintendents are taking leadership in the various counties and it is largely to their efforts that the work owes its success. They are also carefully observing the effect of the work as an educational influence. Supt. O. C. Brown of Roseburg reports that he has carefully examined all records of his county and finds that his best teachers and strongest pupils are those who are in the Club Work.

The matter is well summed up by a quotation from a prominent farmer to the following effect:

"We cannot measure the value of the work that the Government, the College, and the State Department of Education are doing for our boys and girls in this Club service at this time, but, ten years hence, when these same boys and girls are grown men and women handling the affairs of the State, the training they are now getting will tell in better farms, improved home conditions, and in better government."

#### PRESS BULLETIN

During the past two years more than 16,142 news stories have been sent out to the newspapers and technical publications from the Press Bureau. Most of these articles are in the nature of timely suggestions which would be of interest and of benefit to the farmers of the State and to the housewives. The service has been rendered:

- (1) In the form of special stories which are sent to certain papers because they have particular application to conditions existing there.

- (2) Press Bulletins, which are in printed form and are sent to all publications.



(3) Stenciled stories which are sent to a large number of papers, particularly the dailies and the technical journals.

Many engravings are also furnished to the papers of the State.

**Extent of Use.** It has been impossible to keep track of all of the material used by the press during the past two years. The material is so voluminous that it would be out of the question to keep it on file for any length of time. In order to determine how much of the copy is being used, the news clippings and papers were checked for a period of five months. During this period, 263 newspaper columns of material was filed in the bulletin office. It is estimated that this represents only about one-half of the material used, as most of it never reaches the College. At that rate it is conservative to say that during a year, copy to the extent of at least 1000 newspaper columns is used.

#### FARM MANAGEMENT DEMONSTRATIONS

In August, 1916, in cooperation with the United States Department of Agriculture, the Extension Service established Farm Management Demonstration Work in this State. The purpose of this service is to demonstrate to farmers in connection with their own farms, a practical and efficient method of summarizing and analyzing farm business as a means of measuring profit or loss, and deciding upon readjustments that promise to increase its net income. It is also intended to serve to give the County Agent valuable information relative to the successful and unsuccessful methods pursued in his territory.

**Results.** During the year a total of 1428 farms were completely analyzed, and detailed reports have been returned to most of the farmers involved. These reports show in detail the expenditures, the sources of income, the returns from each line of farm operations, and the net labor income. The farmer is also given a statement of the averages of all farms operated under the same conditions in his immediate community, so that he may make a careful comparison of his operations with those of the average farmers and also the best farmers to help to determine efficiency factors. It is too early to determine the final value of this work, but indications are that it is going to be of decided value. A large number of farmers are already introducing methods of farm bookkeeping for the purpose of analyzing their operations in the future, and the various county agents are continuing work along the line of farm analysis, which will undoubtedly help to get farm operations on a business basis.

Of the total number of farms analyzed, the Farm Management Demonstrator analyzed 692 and the county agents, who were instructed by him, analyzed 594. Advanced students in Farm Management have assisted to the extent of analyzing 142 farms under the direction of the demonstrator.

#### HOME ECONOMICS

The women of the State, and particularly the farm women, are coming to a better understanding and a greater appreciation of the work in

Home Economics. Aside from the well recognized fact that farm women are over-burdened, and that the farm home frequently lacks warmth and cheerfulness, it is now becoming evident that farm productivity depends in a large measure upon the farm home. Too little time and consideration has been paid to the problems of the home during the past.

**Nature and Extent of Home Economics Work.** In the organization of the Extension Work in Home Economics the problems have been grouped under three different heads, namely; (1) The Food Problem; (2) The Shelter Problem; (3) The Clothing Problem.

In the prosecution of the Work the Extension Specialist and members of the Resident Staff have written over 280 personal letters to the women of the State in response to such inquiries as how to make jelly, the value of certain foods for children, the equipment and methods of home canning, how to improve the kitchen arrangement, how to plan the day's meal, suggestions for decorating and fitting the house, methods of removing all kinds of stains, etc. More than 150 lectures and demonstrations have been given during the year before women's clubs, granges, farmers' unions, and other local organizations. As the immediate result of work with schools, six schools will introduce Home Economics in their system this year. Eight schools have introduced the warm lunch service, thus increasing the efficiency of the school and improving the health of the children.

Special attention has been given this year to the work in the rural districts with small groups of women. A farm home is selected and the neighboring women are invited to come in for sessions during two days. Upon the basis of this farm home, the problems of that immediate community are considered, including the economical arrangement of the kitchen, the proper decoration of the home, and the diet for the farm family. This has permitted very general and intimate discussions, and detailed consideration of most intimate phases of homelife. It is bringing splendid results, and will probably be adopted as one of the principal methods of Home Economics Extension work.

#### AGRONOMY

The principal project in the field of Agronomy for the past year was the work in drainage, which was reported briefly in the fore part of this report. In addition to this, more than 340 lectures have been delivered, many demonstrations put on, and a great amount of individual service given covering the entire field of Agronomy, including crops, soils, irrigation and drainage and farm management. To indicate the extent of the miscellaneous direct individual service, it is reported that more than 450 visits of this description have been made during the past year.

#### DAIRYING

Particular attention has been given during the biennium to the dairy industry. Three men have been devoting their time to the field work, in

addition to the assistance which has been given in this phase of the work by the Resident and Station representatives. This has been due in a large measure to the fact that the dairy industry is growing rapidly, and is experiencing some of the trying situations incident to development. It is estimated that 20,000 farmers are getting a considerable portion of their income from dairy cows, and that 200,000 cows are kept for dairy purposes. There are at the present time 117 creameries, 75 cheese factories, and 7 condensed milk plants engaged in the manufacture of dairy products. In addition there are a great number of men engaged in selling milk and cream to consumers in all of our cities. The gross returns are not less than \$80,000,000 annually.

**Nature and Results of Dairy Work.** In the prosecution of the Dairy campaign attention has been given principally to the following problems:

The breeding of dairy cattle, which has resulted in distributing over the State many pure-bred sires. It has been clearly demonstrated that the introduction of pure-bred sires into Oregon herds will increase the dairy production by 25 percent. Closely related to this work has been the Cow-Testing Association Work. The Cow-Testing Associations, of which the State has 17, with more than 8000 cows on test, are rapidly weeding out the unprofitable animals, and bringing the industry onto a paying basis. As the result of the work of our Extension Staff, Oregon has more Cow-Testing Associations in proportion to the number of cows than any other State in the Union.

A great deal of stress has also been placed on the feeding problem. Proper rations have been worked out in view of crops that may be grown in different sections of the State, and these rations are being followed widely with the result that production, in many instances, is being increased without additional cost. This campaign has also included the construction of silos. During the past year 44 have been built in Western Oregon and 9 in Eastern Oregon. Many of these have been built under the direct supervision of our representatives. Official testing has also been carried on with splendid returns. The interest is indicated by the fact that during the past year the number of cows under official test has increased from 125 to 400. A hint as to the value of this is indicated by the fact that at an auction of Jerseys in Polk County held last June, animals with official records sold at an advance on the average of 75 percent over those with no official record.

The Dairy department has established, during the biennium, a monthly scoring contest of dairy products. This is having a wide effect in improving and standardizing the production of the creameries of the State. The department has also standardized the glassware used in testing milk and cream as provided for under a law passed by the last legislature. Examinations have also been given to the butter makers of the State as provided by law.

The project receiving special consideration during the past year has been in the field of organization work for the purpose of improving the standard of dairy products and securing better marketing facilities.



Upon the invitation of the State Dairyman's Association, the Grange, a number of Breeders' Organizations, and other farmers' associations, the College representatives joined with the Office of the State Dairy and Food Commissioner, in organizing the creameries of the State into an Association to bring about the purposes above indicated. The organization has been perfected, and is now in operation, with the result that there is every reason to believe that the association will soon find foreign markets for its standardized products that will represent a splendid premium. The service means thousands of dollars to the dairy industry.

Immediately upon the organization of the Exchange, the price of country butter went up by a margin of from two to four cents a pound. Basing the output of the country creameries on the 1915 production, 6,000,000 pounds, and using the minimum advanced price secured, two cents, there was an increased return of approximately \$120,000 to these creameries in one year. While the change in prices may not have been entirely due to the organization of the country creameries, unquestionably that was a strong factor.

### POULTRY

The poultry Extension work has been carried in the form of lectures, demonstrations, exhibits, etc., and, particularly during the past year, the work has centered on the organization of Egg Circles for the immediate purpose of securing better markets, and putting the poultry products on the market to better advantage.

This last line of work has been securing particularly gratifying results. There are ten Egg Circles in operation, with a membership of 300. During the year approximately \$18,000 worth of eggs have been shipped by the Egg Circles. Practically all of these eggs have been sold at a considerable advance over the local market prices, and the producers as a whole netted about \$2,800 more on the eggs sold through the Association than they would have received on the local market. In addition to the actual advantage of the returns on eggs sold this year, the members of the Circles have had a great amount of valuable assistance in improving their methods of raising poultry. The Extension Specialist has given instruction on feeding, housing, etc., which in several definite instances has resulted in material increase in egg production during the past winter months. There is every reason to believe that this organization work will bring greatly increased returns after a longer period of operation.

During the year, more than 300 cockerels and 1,070 settings of eggs were distributed. All of these are from the heavy laying producers bred at the Experiment Station. The increase in production of the flocks of the country with this infusion of good blood is a factor hard to over estimate. Letters reporting marked increase in flock production are constantly coming in from people who secured this stock in previous years. This work has been handled entirely by the Resident Staff of the department of Poultry Husbandry.



## ANIMAL HUSBANDRY

A special Extension man in Animal Husbandry was employed at the beginning of the biennium. During the first year the work was largely in the form of lecture demonstrations, judging of stock, and visits to farms for the purpose of assisting farmers in solving their livestock problems. During the past year the work of this nature has been continued, but particular stress has been placed upon two special projects; namely; (1) The Improving of Oregon Horses; (2) The Cooperative Shipping of Livestock.

In the development of the first project, a number of colt shows were put on in different sections of the State where demonstrations on the proper breeding and care of colts were the principal event. This has had a far-reaching effect in the communities served.

The second project is aimed at a reduction of the cost of marketing livestock by the use of community shipments. Organizations have been effected in Polk, Yamhill, and Linn Counties, and preliminary work is under way in Marion and Lane Counties.

## HORTICULTURE, PLANT PATHOLOGY AND ENTOMOLOGY

The work in these three departments has been handled by one Extension representative with the assistance of the Station and Resident specialists.

The service in this field has been through the use of letters, over 7,500 of which were written during the past year alone. Many timely articles were sent to the press, lectures and demonstrations were given before fruit growers' organizations, granges, etc. Valuable service was rendered at a large number of county and community fairs, both in judging and demonstrating. Many visits were made to the orchards of the State, where advice was given on all phases of the orchard problem, and special attention has been centered during the last year on three distinct projects; namely; (1) Pruning; (2) Spraying; (3) The Marketing of Fruit.

In the prosecution of the first two projects, definite memorandums of agreement were made with the orchardists in different sections of the State, defining conditions under which their orchards might be used for demonstration purposes. On certain days, when conditions were favorable, it was announced that the College Extension man would give a demonstration in the orchard. Following the demonstration, the interested orchardists were divided into sections, and given practice under immediate direction of the instructor. The result is that hundreds of orchardist operators have received not only advice but practice in the most improved phases of pruning and spraying.

The fruit-marketing project was briefly described in the earlier pages of this report.

## ORGANIZATION AND MARKETS

Through the cooperation of the Office of Markets and Rural Organization, United States Department of Agriculture, a Bureau of Organization and Markets has been organized at the College.

The first year was devoted very largely to general lecture work, some surveys, and assistance in helping to perfect a few organizations. During the past year the work has been quite materially extended. Plans of organization and by-laws have been worked out for creameries, cheese factories, farmers' exchanges, and telephone associations. Assistance has also been given in perfecting accounting systems for various types of cooperative organizations.

During the past year more active work has been done in organization, particularly. One result has been the federation of the Farmers' Union and the Grange into what is known as the Farmers' League. This League is centering its efforts upon the improvement of agriculture, better conditions for the rural communities, and improved marketing facilities.

The office has also been a party to the organization work promoted in dairying, poultry, and horticultural fields as heretofore described. Valuable assistance has been rendered in formulating legislation in the interests of agriculture.

## ROAD BUILDING

During the past two years the subject of road building has been handled by Professor Skelton of the School of Engineering. Only part time, however, could be devoted to this work. During this time he has attended 28 meetings, given assistance to 75 people interested in road construction, and has promoted a good roads contest in Benton County in which 23 of the 29 districts were represented.

## MISCELLANEOUS

In addition to the lines of work above enumerated, the College has engaged in a great amount of miscellaneous service. One item that is worthy of attention is the great amount of miscellaneous analyses that are carried on in the College laboratories. The Chemistry department is constantly besieged to analyze soils, water, limestone, sprays, fertilizers, food stuff and other miscellaneous items. The same is true of the department of Bacteriology; and in Plant Pathology and Entomology there is a constant demand for the identification of diseases, weeds, insects, etc. The department of Veterinary Science has also performed a valuable service in analyzing specimens for the purpose of identifying diseases, etc.

The following summary will give an idea, though incomplete, of the scope of the work. This summary, however, does not include any of the activities of the fourteen county agents:

## EXTENSION SERVICE

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## SUMMARY OF ALL EXTENSION STAFF ACTIVITIES OTHER THAN COUNTY AGENT WORK

	1914-1915		1915-1916		TOTAL 1914-1916	
	No.	No. people reached through this service	No.	No. People reached through this service	No.	No. people reached through this service
Lecture Work (one lecture to two-day engagements arranged by requests from communities).....	564	72,515	649	58,357	1,213	130,872
Club Work (lecture engagements).....	702	25,000	481	44,393	1,183	69,393
Demonstrations by Specialists.....	*45	*3,520	543	30,297	588	33,817
Farmers' and Home-Makers' Week.....	1	2,655	1	1,283	2	2,938
Demonstration Train..			1	3,220	1	3,220
Movable Schools (three- to five-day engagements).....	22	15,037	16	11,155	38	26,192
Fairs (Exhibitions and Judging).....	*40	*30,000	44	35,040	84	65,040
Conferences.....	No record		1,579	7,632	1,579	7,632
Farms visited for personal advisory work.	*99	*300	1,498	3,756	1,597	4,056
Letters written.....	21,096	21,096	33,397	33,397	54,493	54,493
Press articles prepared.....	650	\$1,300	1,106	\$221,200	1,756	\$222,500
Correspondence courses.....	33	28	19	23	22	51
Publications						
New Bulletins.....	31		12		43	
Number pages.....	97		194		291	
Number issued.....	137,500	\$275,000	110,500	\$221,000	248,000	\$496,000
Reprints.....	8		9		17	
Number pages.....	80		55		135	
Number issued.....	37,500	\$75,000	29,000	\$58,000	66,500	\$133,000
Barn and silo blue-prints .....	2	6	2	37	4	43
Miles traveled.....	No record					
By rail.....			146,028			
Otherwise.....			32,172			
Total number people reached:						
Directly.....		170,157		228,590		398,747
Indirectly.....		\$351,300		\$500,200		\$851,500

\* Records not complete.

## PLANS FOR THE NEXT BIENNIUM

The general scheme of Extension organization and the fundamental policies are pretty well established. Both the general plan and the general policy of the work are in harmony with the policy advocated by the United States Department of Agriculture and have been commended by Department officials.

**Extension Legislation.** In order to make the Service effective and meet the demands that are being made upon it, the original Extension



law as it was passed by the legislature of 1913 and published as Chapter 110, General Laws of Oregon for 1913, should be re-enacted. This would involve the repeal of Chapter 281, Laws of 1915. Thus, by removing the limitations of \$15,000 placed on the amount the State may appropriate to duplicate appropriations by the United States Department of Agriculture, this would bring to Oregon some very much-needed and very valuable assistance. No danger could threaten the State from this source, as the Department appropriations are increased very slowly and disseminated to the various states very conservatively. It would also have the effect of allowing an appropriation to meet the appropriation required under the Smith-Lever Law. By virtue of the amendment made by the 1915 session of the legislature, the funds required from the State in order to secure the Smith-Lever appropriation are directed to be paid out of the original appropriation made to the College for Extension work. There are some rather severe limitations upon the use of the Smith-Lever funds, and, consequently, the College is left without sufficient funds to prosecute certain lines of work that are of great value and importance. For instance, the Smith-Lever appropriations are limited to 5 percent for publications. No money is permitted to be used for work along the lines of highway construction, engineering work, forestry, farm bookkeeping, correspondence courses of any description, institute work, demonstration trains, etc. Furthermore, the funds are not adequate to meet present needs. As an illustration, the Extension Work in Home Economics is now handled by one woman. It is manifestly impossible for her to do justice to the needs of the farm women of this State. We are compelled to restrict our work in Animal Husbandry to the limit of that which a half-time man can perform. In a great livestock state, like Oregon, this is very evidently inadequate and unfair.

In the amendment of this law, provision should also be made for a long-time contract for the maintenance of county agent work. While there is nothing in the law at the present time to prevent such agreement, the appropriations must be made annually, and there seems to be some doubt as to the possibility of perfecting a legal contract covering more than one year of service. If the county agent work is to be most effective, county men should be employed for a period of from two to three years at least, preferably three years, and the County Court should be bound to maintain the work for that period of time.

It is important that a strong series of Correspondence Courses be established. We now have a few courses in operation, but we have not dared give them proper publicity for fear that we should not be able to meet the demands. Other courses, particularly in the various lines of Agriculture, should be offered within the next year. Great numbers of inquiries are constantly coming to the College from people who wish to take correspondence courses along these various lines. It is impossible for us to establish courses at the present time, however, because we do not have funds to provide the machinery to take care of them. The ex-

perience of other states in this regard indicates that the enrollment would be enormous just as soon as the courses were announced.

As indicated above, sufficient provision has not been made to take care of the interests of the women of the State. Work with women must be of rather intimate nature, and must be carried on with small groups and individuals. In order to do this at all, there should be at least two women on our central staff at the present time, and provision should be made for more assistance within the near future. In this connection it is significant that a number of the northern states, as well as practically all southern states, are providing for County Agent Women who serve the women of the rural districts much as the County Agents serve the men.

Provision should be made for the development of Extension Work in engineering, forestry, and commerce. The slight extent to which we have been able to get into these fields indicates that there is very valuable work to be done. The labor unions of Portland have become very much interested in the engineering work through a series of lectures given before the International Union of Steam and Operating Engineers during the past year. This work has been very effective, and has brought the highest compliments and commendation from members of this organization.

#### ACKNOWLEDGMENT

In closing, I wish to acknowledge the valuable and cordial cooperation the Service has enjoyed from the farmers' organizations of the State, many of the chambers of commerce, the railway companies, the women's clubs, and the State officers. The most cordial relations exist between the Service and all of these agencies.

Respectfully submitted,

R. D. HETZEL,  
Director of Extension Service.

## REPORT OF THE SCHOOL OF HOME ECONOMICS.

To the President of the College,

Sir: The Executive Committee of the School of Home Economics has the honor to submit the following report of the School of Home Economics.

Owing to the fact that in March, 1915, the Dean of the School of Home Economics resigned, the School was left without an executive and so continued until the fall of the same year, when the administrative part of the work was assigned to a committee, composed of the Dean of Women and the heads of the departments of Domestic Science and Domestic Art.

**Student Enrollment.** Enrollment in the School of Home Economics for the year 1914-15 was 336; for the year 1915-16, 354. The increase in enrollment, though not large, is encouraging, for there were two factors operating against a greater increase in enrollment; viz., the decided advance in entrance requirements and the general financial depression. The advanced entrance requirements have made possible a higher type of work, which is being recognized throughout the country. The records of the year 1915-16 show 354 women enrolled in the classes of Home Economics, while 400 is probably a conservative estimate for the year 1916-17. There is every reason to believe that there will be a large increase in enrollment for a number of years to come, since the courses offered afford an opportunity to obtain a broad as well as a specialized training in Home Economics of the very highest character. That the strength of the School's instructional staff and the efficiency of its equipment are broadly recognized, is demonstrated by the constantly increasing number of students who are being enrolled from other states. Recognition of the high quality of the work is evidenced also by the increased demand for the graduates of the school.

**Graduates.** In June 1915, there were 64 who received the bachelor of science degree in Home Economics. In 1916, 83 received the bachelor of science degree. Of the graduates of the year 1914-15, 46 were elected to teaching or institutional management positions. Of the class of 1916, 48 have teaching appointments. There are at the present time more than 60 graduates of the College teaching Home Economics in this state, 75 who are teaching in various other states, 10 who are engaged in institutional work in hospitals, tea and lunch rooms, and other similar institutions. Many who do not wish to teach Domestic Art have used the knowledge gained in the subjects in a more specialized technical way, such as millinery and dressmaking. The salaries of recent graduates vary from \$630 to \$1500. During the past biennium a new field of work has been opened on the coast for those graduates who have received training in institutional management. With this end in view the courses have been adjusted to meet that demand.



**Courses of Study.** The courses in the School of Home Economics include graduate courses, two courses leading to the bachelor of science degree, the vocational course of one year, the summer course of six weeks, a winter short course of one month, and extension work.

Slight adjustments have been made during the past biennium in all of the courses. The most important change made was the introduction of a new course leading to the degree of bachelor of science in home economics which offers broader opportunities for free election. These changes are indicated in the descriptive paragraphs of the respective courses.

**Graduate Courses.** Graduate work is offered in household administration, house decoration, textiles, and in research work in foods. In 1914-15 there were 4 graduate students in Home Economics. In 1915-16 there were 8. The increase in interest in graduate courses indicates the need for placing emphasis on work of this nature.

**Degree Courses.** The degree courses in Home Economics both lead to the degree of bachelor of science. One is planned primarily to prepare teachers of Home Economics, dietitians, and institutional managers; the other is intended, in addition to the work in Home Economics, to afford a more liberal opportunity for election. The first two years of both courses are prescribed, while the last two are elective by groups.

(Quoted from Domestic Science report.) "During the past biennium a very great undertaking was assumed by the department of Domestic Science in the form of the exhibit at the Panama Pacific International Exposition. This exhibit, though expensive in nature, proved to be not only self supporting but profitable. By it, in fact, \$2,000.00 was cleared, one-half of which (the department's share) was presented by the department of Domestic Science to the Student Loan Fund of the College and is now being used to aid deserving but needy young women in their college course. This work not only gave valuable training to the young women participating, but did much to bring the State of Oregon most favorably before the public. The amount of work undertaken and the significance of it to the state is summed up in the appreciation presented by the Oregon Commission which I shall ask the privilege of quoting.

In appreciation of the service and womanly dignity of the senior girls of the Domestic Science department of the Oregon Agricultural College, who under the direction of the instructors of the department, made for themselves a lasting place in the affections of the thousands whom they served at the Oregon Building, Panama-Pacific-International Exposition, 1915, and particularly in the hearts of the "Oregon family," the members of which had the greatest opportunity to observe them at their work, and to note the results favorable to the State, the institution they represented and to themselves.

For ten months they have served luncheons to the public and breakfasts and dinners to the Oregon family, housed in the State building. In this long term of devotion to an ideal, they have been not only efficient to the last degree, but models of sweet womanly dignity in their contact with the public and with the "family."

They have demonstrated a tremendous truth: That Domestic Science is quite as real and vital a thing as any other science. We believe that the thousands of people who have been served by these young women have carried away a newer, finer ideal of domestic service; and that the work of the College girls in personally serving the public has proved the dignity of such endeavor, and has been one of the most splendid features of Oregon's entire participation in the Exposition.

We thank you for having given us this opportunity to observe the magnificent working out of the training given our Oregon girls at the State College.

"Work similar to this was undertaken during the month of January, 1916, to give to the young women, who were not afforded this training at San Francisco, experience of like nature. By the use of the San Francisco equipment, luncheons were served to numbers ranging from 50 to 150 for twenty-four days, all this work giving training in institutional management which the department had not been able to offer before. During the second semester, a class in catering was carried on. The outcome of this work is that young women are being trained for a new field, institutional management.

"So much advice has been sought by men planning and preparing meals while in college that the department offered a course, one evening a week, to give to these managers of clubs and students who are living in small groups, the most essential principles in the selection and preparation of food. So much interest was manifested among the men in this work that a large class was formed. The course is to be continued during the year 1916-17, and will doubtless become a regular part of the departmental work. Surely the significance of such training cannot be questioned.

"Another important course which has been added to the Domestic Science Department is one that gives prospect of great interest and value, not only to the students in the work, but to the State as a whole. May I refer to the paragraph under Experimental Work.

"In addition to developing the courses which have been undertaken in the past biennium, the department has plans under way to offer in the fall of the year 1916-17 a new course which promises to give the most valuable and practical training for the profession of homemaking. This course will be conducted in the practice house where advanced students in small groups will live and conduct the entire duties of the household, under the supervision of an instructor. This course will be to the Home Economics girl what the interne work in the hospital is to the medical student.

"Increased interest is shown by graduate nurses and mature women in fitting themselves for dietitians and work in hospitals. Many institutions in the Middle West and the East are offering a special course of two years to such applicants. The physicians of the West are coming to appreciate the need of dietitians for their hospitals, and women of such training will be in great demand in the next few years; it seems to be within the province of the College to meet this need."

(Quoted from Domestic Art report.) "Adjustments have been made in the Domestic Art department to meet the advanced entrance requirements and to broaden the knowledge and increase the technical skill of the students enrolled in this work.

"The freshman work has been planned to give degree courses with a view to teaching not only an adequate knowledge of processes and textiles, but the pedagogy of the subject, its presentation and development. The freshman work for the general degree course will be given with a view to enable the student in this course to select materials wisely and to understand the processes intelligently, so that her problems in the home may be more satisfactorily solved.

"The other courses in the department have, under the new development of the school, been made elective. This will stimulate the department to greater effort in making the work more effective.

"The department of Domestic Art has given the students majoring in Domestic Art an opportunity for practice teaching in the grades of Corvallis schools. The plan for the coming biennium is to include the high schools in this work. By such an arrangement, the students receive a semester's experience in teaching that is as nearly as possible identical with conditions that are actually in operation in grade and high schools throughout the state."

**Vocational Course.** During the past biennium, the School of Home Economics has extended its field greatly. In addition to the degree course offered up to that time, a course of one year for vocational students was added. This course met a long-felt need, in that it was open to women of mature years who had not had an opportunity to complete a four-year's high school course, or who had not had Home Economics in other institutions. Others registered in the course were women over 18 years of age from rural districts who had received training through the eighth grade. This course was started in September, 1914, with an enrollment of 40. In 1915, 29 were enrolled. With the introduction of Home Economics in the high schools, enrollment in short vocational courses is decreasing in colleges generally.

**Short Course.** During the past biennium there has been a decided increase in the number registered for the short course of one month in Home Economics. This additional work adds materially to the already heavy schedules of the regular staff. The use of outside assistance is recommended.

**Summer Course.** The summer course work of the department has also greatly developed within the past two years. Eight instructors in Home Economics carried the entire work for the summer 1915. Eleven instructors were necessary to carry the summer work in 1916. In addition to this, two special lecturers were engaged. The stimulus derived from such assistance is invaluable.

The summer school students consisted of teachers as well as many graduates from other universities and colleges. This fact made necessary the offering of advanced courses. The classes were well attended and the enrollment in two of the courses of the summer of 1916, ranged from 85 to 90. Many of these students were teachers from other states than Oregon.

**Extension.** (Quoted from Domestic Science report): "In addition to the resident work indicated, the regular staff of Domestic Science has assisted materially in the extension work. From July 1, 1915, to July 1, 1916, twenty-one trips (47 days) were made in response to extension calls. The correspondence has fully doubled within the past two years, and it would be difficult to estimate the amount of information given out in this manner. During the past biennium the following bulletins have been prepared by the Domestic Science department.

The Comparative Cooking Quality of Apples  
Grown in Oregon.

School Luncheons.  
Tools for the Kitchen.  
Food for the Family.  
Methods of Cleaning.

(Quoted from Domestic Art report): "In 1915-16, 37 days were devoted to extension work by the Domestic Art faculty. Beside this service, contributions were made to the Oregon Teacher, Oregon Countryman, Oregon Journal; lectures were given during Home Makers' Conference week, and a conference was held with the Laundrymen's Association to determine the amount of textile adulterations. There are also bulletins in process on house decoration and textile adulteration."



During the Christmas recess the Home Makers' Conference is held, and increasing interest is shown in this very important week. To quote from an article written by Miss Alice Ravenhill, F. R. San. I., Lecturer on Hygiene, King's College for Women, University of London, concerning the Home Makers' Conference:

"The Home Makers' Conference at the Oregon Agricultural College the first week of January 1916, lasted six days. The sessions were twelve in number, each of four hours. For six or seven out of these eight hours a day the hall was crowded to suffocation. The lecturers had hard work sometimes to escape from the crowds of eager questioners, anxious for fuller details of various points. Extra sessions had to be held to meet the demand. The comprehensive programs given and the appreciation of its packed audiences carries at least two lessons with it; first, the progressive spirit and the praiseworthy standards of an agricultural college which presents it, and the high efficiency and zeal of the faculty of Home Economics which can plan and carry through to a splendid success; second, the evidence thus afforded of the real craving of our home-makers for information on a wide range of subjects."

The need of additional assistance for extension is imperative. During the last year members of the regular staff have been often absent on extension work, thus hampering the resident work.

**Personnel.** The success of the school of Home Economics has resulted in great part from the devotion and united efforts of its corps of teachers. Real growth can be attained only where definite policies exist; unsettled teaching force can never bring about such a condition.

The burden of responsibility has been as equally divided as possible, but has been extremely heavy in all cases; long-continued, effective, and enthusiastic teaching cannot be expected from overworked people. A larger teaching force, with a vacation long enough for advanced study and real recuperation, is an absolute necessity; otherwise, the teachers will not be capable of the greatest efficiency.

**Additional Instructors Required.** No additional instructor was added for the year 1916-17, but one new instructor in Domestic Science and one in Domestic Art will be needed in the fall of 1917. This will be necessary owing to the fact that a greater number of sections will be demanded in the departmental work, due to the increase in student enrollment. During the year 1916-17 the senior class will be very small, as a result of the standard being raised for entrance during the last few years. Each succeeding class is larger, however, which necessitates an increase in sections for each course. Due to the introduction of the new degree course in Home Economics several additional courses must be scheduled during the year 1917-18. The great demand in the commercial world for experienced women in the field of house construction, interior decoration and furnishing makes it advisable to contemplate the introduction in this department of more opportunity for study along these lines. With this in view the department of Domestic Art requests the privilege of introducing such an advanced course in 1917-18. This would necessitate the appointing of an especially trained instructor.

**Salaries.** If the integrity of the school of Home Economics is to be maintained, a reasonable increase in salaries will be necessary in the coming biennium. The instructors have given splendid service and their value is recognized by other institutions. Permanency of the teaching force is essential to efficiency. This can best be obtained by adequate recognition of service.

**Home Economics Buildings.** The practice house, which was requested in the biennial report for 1914-16, was granted in June 1916. This house will give to the Domestic Science department facilities for carrying on one of the most significant courses that can be offered by the school.

The congested condition existing during the past year in the present unit of the Home Economics Building, makes imperative the completion of another unit of the building as soon as possible. The rest room and various offices of the east wing have been used for class rooms at different times, and it has been necessary in some cases to conduct two classes in the same room, as well as to convert wood rooms into offices. Classes have also been carried on in other buildings.

**Experimental Work.** (Quoted from Domestic Science report). "During the year 1915-16 experiments have been carried on to determine practical recipes for the use of English walnuts grown in large quantities over the state. Another set of experiments has tested the relative cooking qualities of different kinds of potatoes grown under different conditions in the state, while other students are working on the problem of profitable disposal of by-products of the loganberry industry; the making, testing and compiling of practical ways of cooking and serving not only dried loganberries, but also dried fruits and vegetables of every kind. This work has just been started and will be continued throughout the coming year, new problems being taken up constantly. This knowledge, when collected and disseminated, will aid the above industries of the state to an extent which cannot be estimated.

"It seems that the nature of the experimental work would justify the final establishment of a research assistant in Home Economics who may be recognized as a member of the experiment station staff."

(Quoted from Domestic Art report). "In June 1916, the Laundrymen's Association of Portland, requested assistance in determining the amount of adulterations in staple dry goods that ordinarily find their way into a laundry. Miss Gillett was detailed for this problem and is still working on it with the cooperation of the Chemistry department. More of this work should be done, if the department hopes to be a factor in the state in helping not only to solve one of the problems in 'high cost of living,' but also in the attempt to standardize textiles."

**Clerical Work.** (Quoted from Domestic Science report.) "During the year 1914-15 one full-time stenographer was employed. Many of the details fell upon the Dean and head of the department. The ordering was done by one of the instructors who was able to carry only two-thirds instructional work besides these duties.

"The clerical work for the Domestic Science department has increased so much during the past two years that the work could be handled only by adding to the department a secretary. The secretary does all the purchasing of supplies for the department, is in charge of the storeroom girls, assists in the registration of students and does some instructional work. During the coming year she will have the class in

catering. At times she is called upon to substitute in other classes when extension trips are made by the regular instructional force. The duties of the secretary are such that it involves not only office training but Home Economics training in addition. We have been fortunate enough to find the combination in the present secretary, whose success has been unquestionable.

"This new arrangement makes it possible for the head of the department to have greater time for organization and development of plans in the interest of the department. The department has been able to carry on its clerical work with the addition of approximately three hours a day stenographic work above the time the secretary could give. This work is done by a student who is earning her way in college. Each year the stenographic work increases, and adequate provision should be made to meet this need."

(Quoted from Domestic Art report.) "The correspondence and other office work require the services of a stenographer or student assistant for about two hours daily. There is a constant call for correspondence courses, and as soon as the demand merits the expenditure for such a course, more clerical work will be required."

**State Service.** (Quoted from Domestic Science report.) "Members of the Domestic Science department have taken an active interest in the state and national organizations. Many papers have been prepared, and the members of the staff have presided at meetings and served on committees. A member of the staff is now chairman of Home Economics of the State Federation and of the Mothers' Congress. Further service to the state was rendered by the experimental work and the San Francisco exhibit, both of which have been described in this report. By such activities the department has greatly increased its influence."

(Quoted from Domestic Art report.) "A member of the Domestic Art department spent two weeks touring Southern Oregon in company with two officers of the Oregon Parent Teachers' Association and Congress of Mothers. During this trip seventeen talks were given before the women's clubs and to the girls of the high schools.

As a result of this trip we are having enrolled for next year students from districts where there had been no enrollment before."

Respectfully submitted,

MARY E. FAWCETT  
HELEN B. BROOKS  
AVA B. MILAM

Executive Committee.



## REPORT OF THE SCHOOL OF FORESTRY.

To the President of the College,

Sir: The most significant single circumstance in connection with the School of Forestry during the biennium just closed is the marked growth of the interest of practical timbermen in the work and future of the School. This interest clearly indicates that the School is demonstrating its ability to be of real service to the industry. It also indicates an evolution in the lumber business out of which has come a demand for men trained to meet its peculiar needs. Comparatively low prices for manufactured lumber and increased sharpness of competition have enforced economies in operation hitherto unknown. The increasing distance of stumpage from the main lines of transportation and the complicated and expensive equipment required to transport the timber over the rough mountains of the Coast and Cascade ranges have presented engineering problems of a peculiar character. These conditions have forced upon the timbermen a realization that they must adopt scientifically efficient methods and employ scientifically trained men if they are to conduct their business with profit. The leaders of the industry in Oregon are looking to the College to provide the means for training men in the peculiar needs of their business, and they are coming to designate these men Logging Engineers. It is the task of the College to standardize the type of preparation requisite for this business or profession.

### ACHIEVEMENTS AND GROWTH

**Logging Engineering.** Since the institution of the degree course in Logging Engineering two years ago the demand for high-grade instruction along that line has become so insistent that the employment of a competent instructor in Logging Engineering became imperative. In spite of the fact that the School was unprepared properly to handle the work, twenty-one men registered in Logging Engineering last year and many others, in College and out, were waiting for the institution to make adequate provision for the work before enrolling in the course. In response to this demand the College has secured the services of one of the foremost practical logging engineers on the Pacific Coast, Mr. J. P. VanOrsdel, Superintendent of woods operations for the Portland Lumber Company. As a result of this, from the instructional side of Logging Engineering, the College will not be excelled by any School of Forestry in the United States.

**General Forestry.** During the past biennium there has been the most cordial cooperation between the School of Forestry and the Federal Forestry Service. All of the graduates of the school who have desired work in general forestry have secured employment with the Government. Some are in positions of decided responsibility. The attitude of the Service toward the School is shown by the cooperation extended by the Forest Supervisor of the Santiam National Forest. In connection with the annual field trip of the School he supplied tenting, equipment in the

form of instruments, and the services of four technical men for a period of ten days. This assistance made possible valuable field work for the students. This type of cooperation will be continued. The work in general forestry is making decided progress.

**The Forestry Building.** With the new forestry building completed and ready for use at the opening of the present College year, the School of Forestry, for the first time, will be enabled to enlarge the scope of its activities and to do real constructive work. The forestry building is approximately 80 feet by 136 feet, outside measurements, and is three floors in height. It is of substantial construction and is well adapted to the various phases of forestry work. The first floor space will be occupied principally by the logging engineering laboratories. The second floor contains offices, class rooms, and mensuration and forest-protection laboratories. The third floor is given over to class rooms, drafting room, assembly room, and silviculture and timber-technology laboratories. Spacious, well-lighted halls on the second and third floors will provide room for a collection of the commercial woods of the United States.

**Growth.** During the past three years there has been but little variation in the enrollment of the school. For the College year 1913-14 the enrollment was 81; for 1914-15, 83; and for 1915-16, 80. This condition is attributed to two things. First, the generally demoralized condition of the lumber industry during this period deterred some of those interested from attending College. Second, the inability of the College to provide adequate facilities for carrying on the various branches of forestry work, particularly in logging engineering, kept students from enrolling in forestry because they felt that they would not receive proper instruction. With the lumber industry in a comparatively prosperous condition and with the School equipped for thorough work, a moderate increase in enrollment may be expected.

### NEEDS OF THE SCHOOL

**Arboretum.** There are approximately 200 species of trees in the United States which are of commercial value. But few of these trees are native to Oregon or have been planted about the campus so that students may have access to them. The forester deals with trees. He should have first-hand knowledge of them. One could as well become an expert stockman by reading descriptions of breeds, or a horticulturist by studying books on fruit trees, as an expert forester without having access to the things with which he is to deal. Every School of Forestry in the United States, of which I have any knowledge, has made a beginning, at least, of an arboretum. Aside from the value to the student, an arboretum here would serve a further purpose. It would be a demonstration of the feasibility of planting certain commercially valuable trees in this State. A brief quarter of a century has revolutionized forest values in the eastern half of our country. In less time than that, forest values in Oregon will undergo a marked change. We have a definite duty to the State in accumulating exact knowledge concerning the highest

utilization of our essential forest lands, in anticipation of the time when our vanishing forests and high timber prices force upon our people a realization that it is a matter of wisdom to put our forest areas to their best use. We are expending thousands of dollars in determining the best kinds of grains and grasses to grow upon our agricultural lands. We should be equally wise in ascertaining the highest productive values of our forest lands.

An arboretum suited to our needs should ultimately cover an area of at least 80 acres and should be reasonably accessible to the campus. It should have well-drained soil of average fertility. A feasible method of establishing such an arboretum would be to plant five acres a year until the area should be covered. It is patent that an arboretum holds the same relationship to the teaching and development of forestry that an experiment farm does to agriculture. An allotment of \$2,000.00 to begin this work is recommended.

**Publications.** The general public has practically no knowledge of the extent and values of the timber resources of the State, of the adaptability of the different kinds of timber to the various commercial uses or of the technical properties of the material. States having but a fraction of the forest wealth of Oregon are actively engaged in informing the people, by means of bulletins and circulars, of the value of their commercial woods. It is highly desirable that Oregon, with her unsurpassed forest resources, publish and circulate at the earliest feasible date, information along the lines indicated. It is recommended that \$800.00 be allotted for the publication of two forestry bulletins the coming biennium.

**Books.** The general library of the College is practically without books along the lines of professional forestry. If the School of Forestry is to develop properly, it is imperative that adequate provision be made for securing professional forestry publications. It is recommended that at least \$500.00 be appropriated for forestry books for the next biennium.

**Secondary Wood Products.** Approximately 40 percent of the total volume of the standing tree reaches the stack at the saw mill in the form of boards. About 24 percent remains in the woods in the form of stumps and tops. There is an estimated loss of 36 percent at the saw mill in saw dust, slabs, bark, edging, and trimming. A small part of this saw-mill waste is worked up into lath, box boards, and fuel wood; but the greater part is carried to the burner and destroyed. This material has a great potential value. Sufficient experimental work has been done to demonstrate that Douglas fir, of all the Western trees, is best suited to destructive distillation. About 64 percent of Oregon's forest is Douglas fir. If manufactured under present milling and market conditions, there would be a loss of material in this species alone, of 125 billion feet, board measure. This material contains wood alcohol, oils of a turpentine character, tar, charcoal, and other commercial products. Conditions indicate that the industries will need these materials, especially the alcohol, tars, and turpentine derivatives, at an early date. Here is a



vast mine of wealth awaiting the chemist and the engineer. I believe the State's interests could well be served by the allotment of a liberal amount for investigative work in this field. It is earnestly recommended that steps be taken to begin this work, through the School of Forestry, the department of Chemical Engineering, or through the two working in cooperation. It is recommended that the President require the head of the department of Chemistry and the Dean of the School of Forestry to formulate a special report covering this subject.

**Oregon's Forest Wealth.** Recent estimates by Federal and private agencies place Oregon's forest wealth at 538 billion beet, board measure. Figured at the lowest possible manufactured value at the saw mill, this represents a property of more than \$8,000,000,000.00. The lumber industry of the State is employing over 29,000 men. Approximately 80 percent of the manufactured value of lumber has been expended for labor and supplies. As a matter of broad State policy, our forest wealth should be efficiently manufactured and conservatively and fully utilized. As a matter of College policy, we should be doing our part to effect this end. I have made this brief statement of fact to justify the representations I have made of the need for different kinds of forestry work. I believe the College will be serving the State wisely by making provision for the various lines of forestry, from funds at its disposal, in such proportion as the timber industry bears to the other industries of Oregon.

**Additional Assistance.** During the coming year the work scheduled to the instructors in the School of Forestry is as follows:

	FIRST SEMESTER				SECOND SEMESTER			
	Subjects	Rec'tion	Lab.	Total	Subjects	Rec'tion	Lab.	Total
Newins	5	9	18	27	5	9	18	27
Conover	6	11	18	29	6	7	21	28
VanOrsdel	5	11	15	26	6	13	12	25
Peavy	2	7	6	13	3	7	6	13

Considering the number of subjects carried by Newins, Conover, and VanOrsdel, this schedule is decidedly too heavy for efficient work and continued physical and mental health. To relieve this situation, an assistant in Logging Engineering should be employed for the year 1917-18.

**Traveling Expenses.** In order that there may be close cooperation between the School of Forestry and those engaged in the lumber industry of the State, it is necessary that representatives of the School confer with those men at their various operations. By this means the School will obtain a thorough understanding of their problems and they in turn will become familiar with the scope and character of our work. Since Logging Engineering as a profession is in its infancy, much preliminary work of this character is necessary. The following amounts for the biennium are recommended: 1916-17 (already allotted), \$100.00; 1917-18, \$250.00; total, \$350.00.

Respectfully submitted

GEO. W. PEAUVY,  
Dean of the School of Forestry.

## REPORT OF THE SCHOOL OF ENGINEERING AND MECHANIC ARTS.

To the President of the College,

Sir: I have the honor to submit the following biennial report for the School of Engineering and Mechanic Arts for the period ending June 30, 1916.

During these two years very little equipment has been added; no material changes in the curriculum or organization have been made. On such a basis it would appear that very little need be said concerning the progress made during this period. Yet, viewed on a broader basis and in comparison with other recognized schools of engineering, we find that during the two years mentioned, we have advanced from a position where it was difficult to get just recognition for what we really did, to a position where we are recognized as a standard institution. This is of particular value to such of our graduates as desire to enter the teaching profession, as well as to those who wish to continue their studies by taking advanced work in other institutions.

### COURSES OF STUDY

Under the present organization, four-years courses are offered in Electrical Engineering, Highway Engineering, Irrigation Engineering, Industrial Arts, and Mechanical Engineering. A three-years vocational course, not leading to a degree, is also offered.

**Civil Engineering.** On February 7, 1914, the Board of Higher Curricula issued an order directing "that the Department of Civil Engineering be eliminated from Oregon Agricultural College, except such courses in Civil Engineering as are required in other departments of engineering, including Highway, and Irrigation Engineering, and in the Departments of Forestry and Agriculture at the College." Permission was given to continue the classes already enrolled in the degree course in Civil Engineering, and to establish new degree courses in Highway and Irrigation Engineering.

The effect of this order has been disastrous to the department of Civil Engineering so far as the degree course students are concerned. When the order went into effect, there were sixty-three students taking civil engineering, which at that time offered optional groups in the senior year in Sanitary Engineering, Highway Engineering, Structural Engineering, and Irrigation Engineering. The order virtually eliminated three of these five groups, leaving only the Highway and Irrigation groups with the further restriction that the degrees awarded upon completion of these groups should contain no mention of civil engineering, but only refer to the major subject of Highway or Irrigation Engineering. And this notwithstanding the fact that civil engineering is the oldest and best-known engineering course in existence, and that the general training required is the same for all five groups of major subjects enumerated above.

It was easy to foresee the effect of this order on the enrollment of students in this branch of engineering. From sixty-three, enrolled in 1913-14, the number has decreased to forty, in 1915-16, and this number includes seven who are completing the old course in Civil Engineering. This is a decrease of 36.5 percent. Since no other school in the state offers a course in civil engineering, it is evident that young men preparing for this line of work must seek educational opportunities in other states.

This is especially to be regretted as no branch of engineering is so well known among the people, and none enters more closely into the development and progress of the state or community. It touches almost every industry and every phase of life, dealing as it does first with the surveying and marking of public lands, the location and construction of railways and highways, the building of bridges, tunnels, and canals, the platting of cities and towns, construction of streets and sewers, the drainage and irrigation of farm lands, and the location and development of water supply and water power. These constitute some of the points where the work of the civil engineer is important in the everyday life of a progressive people.

The loss of civil engineering is of course most keenly felt at the College, but it has not been overlooked by engineers and business men who employ our graduates, as is shown by numerous letters on this subject received at the College.

It seems to me highly important that the matter of reestablishing the course in civil engineering be brought before the Board of Higher Curricula for consideration at the earliest possible moment. I accordingly recommend and urge that this be done.

**Highway and Irrigation Engineering.** These are two branches of Civil Engineering which have recently attained sufficient importance to classify them as independent courses. This is especially true of Highway Engineering, which is now recognized by a number of leading educational institutions as a distinct course in engineering, although closely related to the parent course of civil engineering. In this, of course, as in all engineering education, the fundamentals are based upon a thorough high-school preparation, followed by strong courses in mathematics, physics, chemistry, English, and economics. With this foundation, a young man of the proper mental attitude is prepared to enter any branch of engineering after having devoted some time to the characteristic technical studies of his chosen line of work.

Theoretically, then, it is necessary to have only one organization or department of Civil Engineering to carry on all of the work pertaining to highway, irrigation, sanitary, railroad, and structural engineering. It does not follow, however, that best results will always be obtained by this plan. The local conditions surrounding the institution and the personnel of the faculty are frequently controlling factors in the case. With separately organized branches greater freedom for growth and development is allowed, concentration of effort is stimulated, and often



better results are obtained, provided, of course, all work together for the best interests of students and the institution to which they belong.

Our present plan places all branches of civil and highway engineering under one head, with irrigation engineering a separate course. Under the present ruling of the Board of Higher Curricula this seems to be the best arrangement. But if civil engineering should be reinstated, I believe a reorganization should be effected by which all branches of civil engineering should be placed under one head, except the Highway Engineering, which might be maintained as a separate department. My reasons for suggesting that the Highway Engineering be independent are as follows:

First, this branch seems to attract a larger number of students than any other.

Second, the work is of great importance to the people of the state who spend such vast sums of money annually for the construction and maintenance of highways.

Third, the head of the department will naturally be called upon to do considerable extension work, taking him away from the College at times while classes are in session. He will also find it necessary to prepare bulletins on subjects relating to highways, and to cooperate with the State engineer and with the county authorities in educating the people to spend their money wisely for good roads.

All of these considerations seem to justify highway engineering as a separate department.

On the other hand, the demand for irrigation engineering as a separate degree course seems to be very limited, and it might well be included in the general course in civil engineering as one of the elective groups. The department of hydraulics and irrigation would be maintained as a service department for the Engineering and other schools of the College, which is its principal function at present.

With this arrangement, and a strong capable man in charge of civil engineering, I believe we should be in a position to carry on the work very successfully.

**Electrical Engineering.** The department of Electrical Engineering has been under the direction of the present head during the past two years. The technical courses have been reorganized and improved. Some differentiation is made between the strictly engineering and the commercial phases of the work. The latter branch is now claiming a large number of engineering graduates and it seems but just that recognition should be given to this branch of the service during the college course.

A standards testing laboratory where electrical measuring instruments could be tested and calibrated is one of the immediate needs of this department. Estimates for the required equipment are included in the departmental report, and I hope this equipment may be purchased and installed during the next two years.

**Mechanical Engineering.** No change has been made in the organization of the department of Mechanical Engineering during the last two

years. Just prior to the last biennial report, Experimental Engineering was made an independent department, thus removing all of the engineering laboratory work from the Mechanical department. About the same time all of the shop work was transferred to the newly created department of Industrial Arts. By this arrangement, the departmental work is limited to Mechanical Drawing, Mechanism, Machine Design, Mechanics, and Steam and Gas Engineering. The result of this segregation has been entirely satisfactory to the department of Mechanical Engineering, and I believe it has been beneficial to the School of Engineering as a whole.

**Industrial Arts.** The Industrial Arts department offers a four-years degree course for students who wish to prepare for teaching manual training. Results obtained during the past two years fully justify the establishment of the course. Professor Brandon's report shows that thirty men were placed in teaching positions where manual training was the major requirement. The average initial salary of these men was more than \$100.00 a month. Moreover, at the end of this year there are sixteen such positions yet to be filled, with only four available applications from the Industrial Arts department.

Aside from its function of training teachers, industrial arts is a service department for Electrical, Mechanical, Mining, and Logging Engineering, and Agriculture. Shop courses for the students in these various departments are planned, with special reference to the requirements laid down by the department heads.

Very little so-called exercise work is now done in the shops. Construction of useful machines and apparatus for the College is carried on, while matters pertaining to materials and methods are discussed in lectures and recitations.

Professor Brandon says: "During the last two years the following machines have been designed, drawings made in the drawing room, and the machines built in the shop, all work being done by students: three emery grinders, five lathes, one gas engine, one hydraulic press, two sand sifters, two bar testers, one oil-testing machine, one hollow chisel mortiser, one model stamp mill, one belt sander, fifty flasks for foundry, and several smaller machines and a number of tools. If the College had to replace these machines at present commercial prices, it would have to pay from \$3000 to \$4000 for them."

**Vocational Course.** I am sure that the value of this course is not well understood by the people of the State, otherwise a much larger number of students would be taking the work. There are many young men who cannot afford to take a four-years course in high school, followed by a four-years college course, who would be greatly benefited by spending from one to three years in the vocational courses, learning the elements of a skilled trade, and acquiring the fundamentals of a good education.

I believe an effort should be made to advertise the advantages of this work to the people of our State.

**Experimental Engineering.** This is a service department for the School of Engineering, School of Forestry, and School of Mines. All of the laboratory work in testing materials, power measurement, cement and hydraulics, is done by this department. The effect of this arrangement is to avoid duplication of equipment and instructors in the College, and greatly reduce the expense of maintaining this work.

The principal objection urged against this form of organization is that the laboratory work and text-book work related to it are given in separate departments. With proper cooperation between departments, this objection becomes more imaginary than real. Our experience, at least, has fully justified the plan under which we are working.

Aside from the routine instruction given to students, the engineering laboratories are called upon to do a great variety of work in testing materials, and making investigations of general interest to the people of the State. Under the present arrangement, this is virtually the official laboratory of the State Highway Commission for testing all kinds of highway and paving materials, as well as passing upon the quality of finished work. Our laboratories are becoming recognized throughout the State as a place where reliable information may be secured upon a wide range of subjects.

During the past year three quite extensive series of tests were made on concrete for a committee of the American Society for Testing Materials, the purpose of which was to assist in standardizing methods of testing concrete and concrete mortars.

The prime needs of this department are more room and more equipment. The question of room will be discussed under another heading, and the itemized statement of equipment required will be found in the departmental report.

## NEEDS OF THE SCHOOL

**Engineering Experiment Station.** Up to the present time there has been very little agitation in this State concerning an engineering experiment station. Many of the middle-western states have established the experiment stations upon their own initiative, and have provided appropriations for carrying on the work. At the present time the bill of Senator Newlands pending in Congress has for its purpose the establishment of engineering experiment stations in each state, and provides an appropriation of \$15,000 per annum from the federal funds for each state taking advantage of the law.

While perhaps the needs of such an experiment station in Oregon are not as well defined as in some other states, yet the functions of the College in assisting the industries would be greatly enhanced by such legislation. I believe all efforts in this direction should be encouraged and that finally in some form a law will be passed providing federal funds for this work of investigation and experimentation. With such aid, our laboratory facilities would be greatly improved, and the engineering side of the institution correspondingly strengthened.



**Additional Room for Engineering.** In former reports the matter of additional room for the School of Engineering has often been referred to. The same conditions still exist only now in a more aggravated form. With every available square foot of room in Mechanical Hall utilized, and instructors moving from one room to another to hear classes at different periods, all departments are calling for more room and better facilities for carrying on their work.

During the past two years a committee of the faculty of the School of Engineering has been studying this problem for the purpose of suggesting a solution that would meet our requirements in a satisfactory manner and at the same time conform to the financial needs of the institution as a whole. The committee made a report last December going into considerable detail and submitting rough tentative plans for a new building which would relieve the present congestion and provide a permanent home for certain phases of the engineering work. It now seems advisable to modify these plans in some particulars, and to include additional details. This matter is now under consideration by the committee and their complete report will accompany and form a part of this report.

Briefly, the plan is as follows:

Construct a new building 60 x 200 feet and three stories high in the open space just south of the shop buildings. This building to provide room for all of the Experimental Engineering laboratories, the departments of Civil, Highway, Irrigation, and Mechanical Engineering, including the Dean's office. The present Mechanical Hall would then be left for the exclusive use of the departments of Electrical Engineering and Physics.

The construction of this proposed building does not necessarily contemplate abandoning the Old Heating Plant, although it is thought that the room occupied by the boilers will eventually be a part of the engineering laboratory.

The engineering faculty are of the opinion that this is the most feasible plan to secure relief from the present crowded condition, keep the several departments near together, thus insuring coordination of work, and materially raise the standard of the Engineering School as a whole. A rough estimate gives the cost of such a building as \$60,000.

**Library Books and Periodicals.** Broadly speaking, engineering is a profession in which new discoveries are constantly being made and new theories put to the test. The results of these activities are chronicled in books, reports, or periodicals, which are of vital interest to the profession and to students as well.

It is a matter greatly to be regretted that our library funds have become so far depleted that it is nearly impossible to secure additional books on engineering subjects for the general library. Last year no funds were available for books but the periodicals were continued as heretofore. The financial statement for 1916-17, received from the Librarian, offers little more encouragement. The amounts allotted to

the various engineering departments are little more than what is required for the present list of periodicals, while in one instance, the cost of periodicals exceeds the appropriation.

It would be a great advantage to the Engineering School if small annual appropriations could be made to the departments which would enable them to add a few good books to the general library each year.

**Equipment.** The subject of equipment is discussed in detail in the departmental reports, where itemized lists of requirements are given. It hardly seems necessary to repeat the details in this report, or to argue for the separate needs of the departments.

There is a constant demand for more equipment from nearly all departments in order to expand their fields of endeavor or to provide for additional demands made upon them as service departments. Both of these requirements must be met, at least in a conservative way, in order to satisfy the just demands of students and also to afford a healthy growth to the individual departments. An atmosphere of progress and activity is thus created which is essential in dealing with present-day problems in technical education.

During the last two years approximately \$2600 has been expended, and \$1000 has been apportioned among the departments for the year 1916-17 for purchase of equipment. This amount is far too small to meet the demands thrust upon the engineering school to build up and maintain a high-grade institution.

Some of the purposes for which equipment is desired in the near future are:

Apparatus for a laboratory of standards in electrical engineering.

Additional equipment for the engineering laboratories in the department of Experimental Engineering.

Additional equipment for the shops in the Industrial Arts department.

Upon a conservative estimate \$10,000 would be none too much to provide for these needs during the next two years. In fact, the department estimates considerably exceed that sum.

**Miscellaneous.** In closing, I wish to say that all departments in the School of Engineering are working together in harmony for the uplift and advancement of the School of Engineering and the whole College. Never has a better spirit been manifested among the faculty than that which now prevails. The students also have been alert and faithful to duty as shown by the decrease in the number of failures recorded.

Under these conditions, I anticipate a period of growth and progress during the next biennium second to none in the history of the School.

Respectfully submitted,

G. A. COVELL,

Dean of the School of Engineering and Mechanic Arts.

## REPORT OF THE SCHOOL OF MINES

To the President of the College,

Sir: I have the honor to submit the following report concerning the School of Mines covering the past biennium:

During the past four years Oregon has experienced a most marked increase in her metal production, which has grown from less than three-fourths of a million total output in 1911 to over two million dollars in 1915, with very good prospects that 1916 will pass the four-million-dollar mark. Many mines that have been idle for years are now some of our foremost producers.

### GROWTH AND FUNCTION

**The Growth of the School of Mines** since its organization has been steady, and in direct proportion to the increasing activity in the mining industry of the State, as shown by the following table giving the number of mining students registered in each of the last three years:

	1913-14	1914-15	1915-16
Number of students .....	28	51	79

**Awakening of Mineral Industries.** The increasing demands for men in the ceramic and chemical industries have attracted an increasing number of students to these courses in the School of Mines in the past two years. The peculiar industrial conditions thrust upon our nation since the war began by the cutting off of the supply of a large number of commercial products heretofore imported in vast quantities from foreign countries, have brought both the chemical and ceramic engineer into great prominence. Prior to the war, the United States brought in from foreign countries all of her potash, as well as numerous other alkaline and chemical salts of different kinds. Germany supplied most of our high-class dye-stuffs. Millions of dollars worth of pottery products, china ware, and the raw materials for their manufacture, formerly came from European countries every year. Many other examples might be mentioned.

The failure of these foreign sources of supply has brought this country face to face with the necessity of producing at home these essential commodities. It is not generally realized that the United States is practically as independent in the possession of the essential mineral resources as in food supplies. This is true, however, for certain of our mineral resources await development only.

**The School Promotes the Mineral Industries.** It is generally recognized that the greatest need in the Northwest is the creation of new industries based on our natural resources. The three departments in the School of Mines, Mining Engineering, Ceramic Engineering, and Chemical Engineering, peculiarly fit into this program, since the work of these



departments has to do solely with the industries that are based upon natural resources.

The School of Mines of the Oregon Agricultural College has been in very close touch with the mineral industry during the years of increased production. Certain members of the School of Mines faculty are employed for a portion of the year on the staff of the Oregon Bureau of Mines and Geology. It is the testimony of the mine operators of the State that this bureau and the School of Mines have been a most important factor in bringing about the recent growth of Oregon's mineral industry. The School faculty is thus kept in close contact with the development of every phase of the industry.

Since all the foregoing conditions are being directly reflected in the increasing registration of students in the School of Mines, and there is every reason to expect this growth to continue, it is absolutely necessary for the School to keep in the fore front of this industrial development, which is every day demanding the services of a growing number of technically trained men.

**Two-fold Obligation.** The tremendous obligation thus thrust upon the School of Mines at this time is two-fold. First, the State has a right to demand from us leadership in the rapid expansion of the industries represented by the departments in the School. Second, the unprecedented registration has greatly increased the size of our classes so that there is scarcely a laboratory or lecture course which does not call for considerably increased equipment in order barely to take care of the students who are applicants for the work. Hence the students have a right to the use of enlarged facilities. A list of the imperatively needed equipment in the School of Mines is accordingly given subsequently in this Report.

## DEPARTMENTS AND FACULTY

There are at present three authorized departments in the School of Mines; namely, Mining Engineering, Ceramic Engineering, and Chemical Engineering. The instruction in the first two years of the degree course is identical in the three departments. At the beginning of the junior year, the School of Mines student has the opportunity to choose his major, leading to the degree of Bachelor of Science, in any one of the three departments.

**Mining Engineering.** The technical work in the department of Mining Engineering is designed to give the student thorough training in the fundamentals of the sciences of mining and metallurgy. The field for the mining engineer in the State is increasing rapidly, partly due to the steady development of the industry but more because of the intimate contact maintained between the active mining men and the School of Mines faculty through their investigational work. Such constant contact accounts very largely for the evidences of confidence and support on the part of the mining men.

**Ceramic Engineering.** Ceramic Engineering is the application of chemistry and engineering to a well-defined group of non-metallic mineral industries; namely, clay-working, glass manufacture, and cement manufacture. These industries all produce silicate products, employing the same raw materials to a large extent, and thus constitute a natural division of chemical technology. The ceramic engineer should be something of a geologist and mining engineer to discover and work his raw material; he should be a mechanical engineer to prepare these materials and to manufacture them in the required shape; and he must be a chemist to understand what takes place in his kilns and furnaces. His course, therefore, while founded upon chemical technology, must be broad and varied, and include a large amount of general engineering.

**Chemical Engineering.** The course in Chemical Engineering has been prepared to meet the growing demands for trained men in the numerous industries that employ chemical processes prominently in their work and that are not included in the fields of metallurgy and ceramics. Among such may be mentioned the manufacture of acids, alkalies, salts, paints, dyes, soaps, glue, starch, sugar, preservatives, antiseptics, fertilizers, paper, and artificial illumination and heating gas. Sulphuric acid has been in the past years thrown away in vast quantities from our smelting processes but is now used in large quantities for the manufacture of explosives. The enormously increased demands for the fuel oils have also opened a new and important field for the services of the chemical engineer. The demands along the lines of chemical engineering will evidently grow as the manufacturing industries suggested in the above list are developed. Since most of the work in Chemical Engineering is closely related to the metallurgical and chemical work of the School of Mines, it can be cared for without the addition of a large amount of expensive equipment. It seems desirable, therefore, to develop this department as fast as the progress of the industries related to it in the State seem to warrant.

**Geology.** In the School of Mines there is really a fourth department, although at present no degree is offered; namely, the Geology department. The work in this department includes crystallography, blow-piping, petrology, mineralogy, and geology courses, and is required, with a few exceptions, of all students in the School of Mines. The facilities and equipment in the Geology department are steadily being augmented by very helpful material. The close touch that the department has with the State investigational work, makes it possible to add materially to its collections and equipment both in quality and quantity.

**The Faculty** of the School of Mines for the past two years has consisted of five persons, a part of whom have been employed jointly by the College and the Oregon Bureau of Mines and Geology. During the past year, 1915-16, an average of 79 hours of classroom and laboratory work a week has been given; this has demanded the equivalent of the full time of four instructors.

The largely increased registration of students in the School of Mines and particularly the requirements for instruction in Chemical Engineering subjects, makes necessary the employment of one additional man for the coming year. I therefore recommend that a new man, capable of handling Chemical Engineering subjects, be employed. It is impossible to say what amount will engage the services of a suitable man but I will suggest tentatively the sum of \$2000.

Great difficulty is involved in securing and keeping men on the School of Mines faculty, for the reason that salaries paid for good men in the practical industries related to mining are usually much larger than those of the teaching profession.

Respectfully submitted,

H. M. PARKS,  
Dean of the School of Mines.



## REPORT OF THE SCHOOL OF COMMERCE.

To the President of the College,

Sir: I have the honor to submit the Biennial Report of the School of Commerce for the years 1914-15 and 1915-16.

### HISTORICAL

The Commercial courses were introduced into the College curriculum in 1867. When the College became a state institution in 1885, in conformity with the provisions of the Morrel Act, the courses in commercial training were continued down to 1898, when a regular two-years course was established. It was soon apparent, however, that those engaged in commercial pursuits needed just as broad training as those entering any other profession or vocation. Accordingly, in 1900, the courses were extended to regular degree work. The first class was graduated in 1907. Since then 139 students have received their diplomas as Bachelors of Science in Commerce. In 1914 the Board of Higher Curricula defined the scope of the work of the School of Commerce, and limited the courses to the Bachelor's degree, except in Rural Economics.

The present organization of four distinct departments, Business Administration, Political Economy, Political Science, and Office Training was instituted in 1908. Data concerning the steady growth, occupations of graduates, and other important statistics are found below:

The attendance of the School of Commerce since 1909 has aggregated 1219 students majoring in Commerce. This is an average of 11.5 percent of the enrollment of the whole institution. This ratio has been maintained with surprising regularity.

### ACTIVITIES OF THE SCHOOL OF COMMERCE

The activities of the School of Commerce may be grouped under three heads: Instructional, Extension, and Investigational work. Each of the four departments has assigned to it certain problems and activities lying outside of its regular work in resident instruction. The department of Business Administration specializes in statistics and cost investigations; the department of Economics and Sociology has the direction of the Bureau of Markets and Rural Organization; the department of Political Science devotes considerable time to rural and industrial legislation, while the department of Stenography and Office Training has charge of the correspondence and normal courses in commerce.

### INSTRUCTIONAL WORK

Seventy-eight different courses are offered by the four departments, totalling two hundred and three credits. A large percentage of these courses have been adapted especially for students in other departments.

It is largely this adaptability of the commercial courses to the various vocations of life which has earned for the Oregon Agricultural College School of Commerce a considerable reputation beyond the State.

I shall now consider briefly the distinctive work of each department.

#### BUSINESS ADMINISTRATION

The aim of the department of Business Administration is to train men and women for efficient business management. This includes thorough courses in the various phases of Accounting, Auditing, Business Organization, and Business Management.

While the courses in Business Administration are primarily designed to fit students for the countinghouse and business office, it is found that such positions are generally only stepping stones to more advanced positions of trust and responsibility. A large percentage of the commercial students eventually engage in business of their own.

The School of Commerce has taken a leading part in developing courses in business methods especially adapted to the farm, to the various industries, and to cooperative enterprises. Such courses are given not only in residence but also by correspondence.

When it is remembered that every vocation has its business side, and that this phase of all pursuits is receiving increasing attention, it is apparent that the avenues of employment and the chances for promotion by the really competent business expert are almost unlimited. A large proportion of the graduates in commerce find employment as teachers of commercial subjects in state and private schools; to them the courses in business administration are very important.

#### ECONOMICS AND SOCIOLOGY

The work of this department serves a three-fold purpose:

(1) **The training of men and women for citizenship.** Every citizen has business relations requiring a knowledge of the fundamental principles of political economy. Then, too, the necessity of such knowledge is especially felt in a democracy where every man and woman has the right to vote, and is called upon to mold legislation directly. The basis for intelligently exercising this paramount duty of citizenship can only be supplied by a training in economics and sociology, the problems of which form the subject matter of all legislation.

Concerning this function, I quote from the report of Dr. Macpherson, as follows:

"In our courses in Economics and Sociology, consistent effort is made to keep close to the practical problems of the State. The department is in constant touch with organized labor as well as with the organized farmers of the State of Oregon. We look upon their problems as the basis from which economic and social theory is interpreted and, wherever possible, we strive to be of assistance in helping solve those problems in a practical way. For example, the head of the department and other members of the department, have cooperated consistently in helping the organized farmers frame remedial legislation, both for the State Legislature, and for the initiative elections. The results of this practical contact with the affairs of the State are embodied in class-room

discussions with a view to letting students see that the work they are doing is a training for citizenship."

(2) **To provide courses supplementary to the various branches of applied science.** To the agricultural college belongs the special task of developing the field of Agricultural Economics and Rural Sociology. It is the aim of this department to provide the necessary training for teachers in these subjects, to prepare specialists for research work in economic and social surveys of rural communities, and to equip those who will make a life work of organizing farmers' associations for the more economical conduct of the business side of farming.

(3) **Field Work. The Bureau of Organization and Markets.** At its meeting October 9, 1914, the Board of Regents established the Bureau of Organization and Markets for the purpose of assisting farmers in the marketing of their products.

The work of the bureau is, first, investigational. It aims to find out the conditions fundamental to successful marketing, and to place the results of its investigation at the disposal of all who are interested.

Second, it is at the service of any group of farmers contemplating the establishment of any sort of business organization. It has worked out model constitutions and by-laws and standardized systems of accounting; it has lists of equipment and can guide the farmers to where such equipment can be most cheaply obtained. It will also assist organizations in planning the kinds of plants necessary to carry on their business.

#### POLITICAL SCIENCE

The work of this department includes two divisions: business law and government. In the business law courses, arranged to accommodate students of different preparation and needs, the department endeavors to train the students for practical business affairs, particularly to give the legal information necessary to prevent the common business errors. Special attention is given to industrial and rural problems.

In the courses in political science proper, the department seeks to instruct in the basic general principles of all government, with particular attention to that of the United States, the rules and principles which regulate the relations of governments with each other. The courses are planned with the purpose of equipping students for an intelligent participation in governmental affairs.

#### STENOGRAPHY AND OFFICE TRAINING

The courses offered by this department are for four classes of students: (a) those desiring a thorough training as stenographers and typists, including an increasing number of students from the industrial departments of the college; (b) those desiring to go still further into the field of court reporting and secretarial training; (c) those desiring to enter the teaching profession; and (d) those commercial teachers desiring advanced training.



## CHANGES IN COURSES

As stated in the introductory paragraph, the work of the School of Commerce has been limited in scope to courses leading to the bachelor's degree. While this has retarded the growth of the School, it has had the effect of strengthening the courses already offered. It will be the policy in the future to bring every course up to the highest standard of efficiency. No important changes are contemplated, in fact no new courses can be introduced without approval of the Board of Higher Curricula. As a result of the growing demand for commercial courses from other departments, a very important change in policy was made last year. The courses in the Junior and Senior years were made entirely elective, the only requirement being the required number of credits and standard of courses. The result is that students may with the greatest freedom major in commerce and minor in other courses, or major in some other departments and minor in commerce.

## EXTENSION ACTIVITIES

In extension activities, such as rural conferences, short-course lectures, and itinerant schools, the School of Commerce has taken an active part. Special service in extension work has been rendered by the department of Economics, particularly in the Bureau of Markets. A detailed account of this work is given in Dr. Macpherson's report. The members of all the departments in the School are prepared, and hold themselves ready, to give lectures in their respective fields. This work includes lectures on accounting methods, economic subjects, business and rural law, various topics relating to citizenship and government, office training, and the teaching of commercial subjects. Several members of the faculty have lectured in various parts of the United States in their respective fields. While this work is usually done during vacation and is an added burden on the faculty, the work is done cheerfully and should be encouraged.

Correspondence work was introduced in the institution by the School of Commerce under the title "The Farmers' Business Course." It embraces Farm Bookkeeping, Agricultural Economics, Business and Rural Law, and Stenography. Within the scope of its courses the School is also prepared to give aid on request in the preparation of bills to be submitted to the legislature or to the people through the initiative and referendum, both in the collection of material and in the technical work of bill drafting.

## PUBLICATIONS

Several publications have been issued by the School during the last biennium. During the winter of 1914-15 the department of Political Science published a bulletin on "Oregon Laws of Real Property," and last winter two manuscripts were completed: "A Survey of Typical Cooperative Stores in the United States," and "Business Practice and Accounts for Cooperative Stores." Both have been published by the United States Office of Markets and Rural Organization.

## INVESTIGATIONAL WORK

The investigational work of the School is conducted, for the most part, in collaboration with the United States Office of Markets and Rural Organization. Our own Bureau of Markets was the first to collaborate with the Federal office in definite projects. Dr. Macpherson's untiring work in connection with cooperative organization deserves special commendation. It is fully set forth in his own report as Director of the Bureau of Markets. During the summers of 1915 and 1916, the writer made extended trips for the United States Office of Markets, through eleven States, studying closely the cooperative store. The results of this investigation are set forth in the bulletins mentioned.

It is the desire of the department of political science to make a careful study of rural law and legislation for the benefit of the Oregon farmer as soon as time and means are available.

An arrangement has been perfected between the United States Office of Markets and Rural Organization, the Bureau of Business Research of Harvard University, and the School of Commerce to investigate cooperatively certain important problems in business practice.

## EQUIPMENT AND ROOM

My estimate for equipment for the entire School, exclusive of equipment purchased with student fees to maintain the laboratories, is only \$294.00. The School is now almost completely equipped for efficient work. Our policy is to purchase nothing that is not imperatively needed. We have no dead equipment; all is in constant service in the class room and laboratories.

While we shall do our best with our limited room, we must anticipate a considerable enlargement of quarters, due to increased attendance.

## FUTURE PROSPECT

The prospect for the School of Commerce has never been brighter. Every year demonstrates the imperative necessity for industrial and commercial preparedness. Knowledge of general economics, of markets, transportation, the science of government and correct business practice, are fundamentals in modern industrial and commercial education.

Industry and commerce cannot be separated. One is impossible without the other. Neither can industrial education be separated from commercial and economic training. The Oregon Agricultural College has been called "Industrial Oregon in Miniature," which implies that at this institution should be found courses of study promoting every important industrial and commercial pursuit and also courses which aim to develop the highest type of citizenship.

With the loyal cooperation of the administration, the faculty, alumni, and students, and the continued support of the people, the ambition of the School of Commerce will be realized; namely, to do its share in the industrial and social development of Greater Oregon.

Respectfully,

J. A. BEXELL.

Dean of the School of Commerce.

## REPORT OF THE DEPARTMENT OF PHARMACY

To the President of the College,

Sir: I have the honor to submit the following report for the biennium ending June 30, 1916:

**Reorganization of Courses.** All courses in the strictly pharmacy subjects have been reorganized and strengthened in every possible manner. The number of courses has been increased from 8 to 14 and this does not take into consideration those courses that run throughout the college year. The entire curricula for the three courses offered by the department, as well as the requirements of each course, are of such standard that we now meet the highest requirements of pharmaceutical instruction in this country. The department was admitted as a member of the American Conference of Pharmaceutical Faculties at their meeting in 1915. Not only did we meet the high requirements of this organization but exceeded them in entrance requirements and number of hours of instruction. Through this reorganization of courses our students can exchange credits with the best schools of pharmacy as well as with professional schools of high standing. In addition to the three distinct courses we are also preparing many students for entrance into professional

### SCHOOLS

**Enrollment.** With the raising of standards in 1914 there was a slight decrease in attendance as compared to the years when only one year of secondary work was required. There was a decided increase in enrollment in 1915-16 and it was gratifying to note that the majority of students were better prepared to take up the work than in 1914. It is a pleasure to note also that all students who have sufficient funds and the necessary time, elect the four-years course. Those students who have had considerable drug-store experience, however, are doing splendid work in the two-years course.

**Graduates.** At the commencement in 1915 ten students graduated from the four-years course receiving the B. S. degree in Pharmacy and four graduated from the two-years course receiving the degree Graduate in Pharmacy. At the 1916 commencement ten received the B. S. degree and three received the degree Ph. G.

All graduates are now either holding responsible positions or are in attendance at schools of medicine working for the degree Doctor of Medicine, for which the four-years course in pharmacy is ideal preparation.

During the last biennium no student has failed to pass a satisfactory examination before the State Board of Pharmacy. At each examination an O. A. C. student made the highest average of all applicants.

**Additional Assistance.** On account of the lack of an experienced instructor, the head of the department has been compelled to carry a very



heavy teaching schedule throughout the last biennium. This in connection with the management of the department allows but very little time for work that is of vital importance to the future development of the department. An experienced man should be employed.

**Drug Laboratory.** During the time that I have been connected with this department I have noticed the need of a drug laboratory. We receive many samples from residents of the State requesting information relative to drug preparations and in each instance we have been compelled either to report after a few preliminary tests or else return the sample on account of the lack of apparatus necessary for the analysis. Nearly every state school of Pharmacy maintains a drug laboratory, which is found to be of great value to the people of the state. The purpose of a laboratory of this character is to test unknown drug samples for identity, and for the detection of dangerous ingredients; to determine whether certain preparations can safely be used for children; to test for poisons in accidental medication, and to standardize drugs that are being grown in this State.

**Drug Garden.** Since the growing of drugs has become a large industry in this country many schools of pharmacy maintain an experimental drug garden. Oregon is well adapted to the growing of drugs and it would be of advantage to the State and this department if a garden could be maintained at the College. For this work it would be necessary to select two acres of ground in a permanent location, as many drugs do not mature in one year and could not be transplanted. The cost of keeping up a garden at this College would be nominal as compared with schools in the larger cities, because we have all of the facilities for the work and the students in Pharmacy would plant and collect the drugs.

**Cost of Instructional Work.** As it was impossible to engage an instructor for the school year 1914-15, the head of the department taught all but one of the strictly pharmacy subjects. Assistance in the laboratory was secured through advanced students. By this arrangement the department saved \$800 on salaries.

On account of the war the price of drugs has advanced to such an extent that the cost of the stock exceeds the estimates. By careful rearrangement of laboratory experiments, however, we have been able to give thorough instruction in the laboratory. At the present price of drugs, student fees are not sufficient to pay for the cost of materials they use. I am pleased to report, however, that through arrangements with the Administrative Office we now have a complete stock on hand and are in a position to give standard courses.

**Improvements.** The department is conveniently located on the fourth floor of Science Hall and upon completion of the repairs that have been started, there is ample room for the number of students now enrolled.

In order that students may have the convenience of private lockers each desk should be provided with master-keyed locks. This could be done at the expense of \$60 for the entire department.

The stock room shelves are built of rough lumber which is the cause of much inconvenience and loss of stock. There should either be a covering for the shelves or they should be planed and painted. The stock room should also be equipped with water and sink to be used in the preparation of student supplies.

Metallic drug bins should be provided for storing crude drugs to prevent insects and mice from destroying certain drugs.

Our present lecture and demonstration table, a cast-off of the Chemistry department, is not adapted for the work. We need a long table equipped with water and gas.

Lecture demonstrations are far more satisfactory than explanations with extemporaneous drawings on the blackboard. All scientific schools aim to develop the work in lecture demonstrations. This department, however, has practically no demonstration apparatus and I respectfully recommend such equipment to the extent of about one hundred dollar's worth.

A department of Pharmacy needs a projection lantern to show the hundreds of ambiguous and dangerous prescriptions that are likely to come before graduates in the course of their work as prescription dispensers. Such a lantern may also be used to advantage to show sophistication of drugs when the actual sample is not available, to show the character of growing drugs, and many other necessary illustrations that cannot be conveniently shown on account of the lack of the proper materials.

Fire escapes should be installed on Science Hall, since in case of a serious fire on any of the first three floors, our students in Pharmacy, on the fourth floor, would be in great danger.

Respectfully submitted,

ADOLPH ZIEFLE,

Professor of Pharmacy.

## REPORT OF THE LIBRARIAN

To the President of the College,

Sir: I have the honor to submit the following report for the biennium ending June 30, 1916.

**Size of Library.** The library consists of 37,465 volumes, including government documents, together with about 86,000 pamphlets. It subscribes for 440 periodicals and receives about 200 gratis. The library has received 343 volumes as gifts, (exclusive of those received as continuations), 271 of which were the gift of the Carnegie Institution of Washington. In addition to the gift of its back publications the Carnegie Institution has placed our library on its mailing list for its future publications. The value of this service to our College can hardly be overestimated, as the scientific research of the institution is of the highest grade carried on in this country. The remainder of the gifts are from individuals and the Rockefeller foundation. A very welcome gift was a file of the Breeders' Gazette, from Governor Withycombe; also another gift of books from Mr. Wallis Nash, one of the members of our first Board of Regents. Mr. Nash has been a steady donor of books to the library for several years; our faculty also have continued their generous donation of books. We are still indebted to the editors of our county and town papers and of many agricultural papers, who have very generously bestowed upon the College gratis subscriptions. These papers are greatly enjoyed by the student body.

**Quality.** While our library is not large, its quality is gratifying. We have several collections which compare favorably with those of any other college in the United States, notably those in horticulture, plant pathology, economic entomology, and household economics.

During the past biennium the library received for books and periodicals the sum of \$3,752.89.

**Library Staff.** The library staff consisted of the Librarian and five assistants, together with a page working not more than three hours a day.

**Service.** The regular service directly to the public consists of the circulation of books and reference work for the students and faculty. The library hours during the regular college session are from 8:00 a. m. to 10:00 p. m., with a closed hour each for luncheon and dinner, for five days a week, and from 8:00 a. m. to 6:00 p. m. on Saturday, making a total of 61 hours a week during the regular college session, and 45 hours during the summer vacation.

**Special Service.** A one-half credit course is given all freshmen in the use of reference books, catalogues and indexes. Without this preparation of students to serve themselves in the library, it would have been



quite impossible for the present small library staff to care for the work of the past biennium.

A service to the faculty which seems much appreciated is sending out to them lists of the new books added to the library. This service has greatly increased the circulation of books among the faculty covering a wider range of reading, thus broadening the culture of our faculty. This result has been very gratifying to the library.

Lectures have been given by the Librarian to the students of the Winter Short Course on reading material valuable to the farmer and his home and how this may be obtained. Lectures have also been given to the Home Economics seniors on literature for the home.

The Librarian has gone out on several occasions at the request of the Extension Service of the College to address women's clubs on the subject of reading for the home and especially reading for children. She has also been called upon to address several schools and colleges on the subject of good reading.

One department of the library has been greatly strengthened by the better organization which we were able to effect when our library was granted its fifth assistant. This department, that of the continuations, has succeeded in completing our files of many valuable reports and bulletins, and has greatly increased our mailing list of valuable continuations. The assistant in charge of this department has succeeded in interesting our faculty so that large numbers of bulletins and reports which were formerly destroyed are now preserved for our exchange file and reference work. Our duplicates have been arranged so that they are instantly available for exchange or reference. This is a very valuable piece of work, which too many colleges neglect, to the great detriment of efficiency and economy.

Another special service, through which our College received national recognition, was in the election of the Librarian to the chairmanship of the Agricultural College Libraries Section of the American Library Association for the year 1915. This was an opportunity for service which we appreciate, as this section does valuable practical work for the agricultural colleges of the country.

I should like to commend to your attention the cheerful faithfulness of our library staff; they have been insufficient in number to meet the demand of our work, and they have worked under the most harrassing and hampering conditions due to our crowded quarters, but there has been no complaint, nor has their enthusiasm diminished. Ideals which can stand the strain to which theirs have been subjected are both high and practical. Acknowledgment is also due to our faculty for the patience with which they have endured our impaired service, and their often warmly expressed sympathy with and appreciation of our limitation of funds and room. Their understanding sympathy is deeply appreciated and has been an inspiration to every member of the library staff.

**Growth of the Library.** On June 30, 1912, the library contained 11,405 catalogued volumes, on June 30, 1914, 21,245, and on June 30, 1916,

29,196. It will be evident that, from the small sum of \$3,752.89, the sum allowed the library for the last biennium, all of this gratifying addition could not have been secured by purchase. It has been largely the result of the library's effort to secure gratis much valuable material. The time ordinarily expended in the purchase of books was spent in the search for material of value which could be secured gratis.

**Needs.** It is unnecessary to state that our library appropriation must be increased if we are to furnish the material which will keep our library abreast of the instructional and research demands, due to the constantly increasing enrollment of the College. In 1913-14 our enrollment was 2,435; in 1915-16 it was 3,265. Ordinarily the rank of a library, compared to that of other libraries, is determined by the number of volumes, by the number of students, and by the appropriation for the growth of the library. Our library should have a fund of at least \$10,000.00 a year, and even such an amount would only allow us to keep up with the present discoveries and applications of science; it would not allow us to build up that background of the history of science so necessary to those who are trying to discover the lines of development along which nature works.

The steady growth in the size of our student body, the increase in the quality of work done due to the advance in entrance requirements, an advance which brings our work up to the standard of the best universities, is greatly increasing the obligation for service expected of the library. We must have at once, as stated elsewhere, another assistant, if our service is not to be seriously impaired. This one additional assistant will probably meet our need for the coming biennium.

**Library Building.** As to our need of a library building, some of our limitations are given in another portion of this report, but the need is so obvious that one walk through our crowded quarters, scattered up-stairs and down in numerous class rooms, is all the argument needed.

Mr. President, observation of college libraries leads me to believe that the library does not occupy its true place in the mind of the administrative body of most of our colleges. I believe that you, more than any other administrative head I know, realize the position of the library in the scheme of college life, yet I wish to call your attention to certain factors which show the value of the library in the work of the College. I think that it can be proved incontrovertibly that next to your own office, the library is the most important factor in the service of the College to the state. A college of the nature of ours serves in two capacities, through its instructional service and its research work. That the research work of the state may be done at the maximum of efficiency with the minimum of cost, it is necessary that our research men shall be acquainted with the very last discovery that has been made in their line, they must stand on the topmost stone of work done by other states and countries, otherwise there must be expensive duplication of work already accomplished, with the danger of failure

in reaching the practical end which might otherwise have been attained. The state can afford no such extravagant method in its efforts at service to the people through research into the natural resources and possibilities of its territory. But how shall this be avoided? There is but one resource—the library. A college library must be equipped with power to furnish reports upon notice of the latest achievements all over the world. This is a large order, and it is evident that four things are absolutely necessary to the makeup of such a library. It must have an administration with vision enough to see the vital demand, capability for collecting the necessary material to meet the need, and organizing ability to make this material instantly available. It must have a sufficiently large staff, so educated and trained as to understand the needs of the patrons of the library and able to serve them quickly; it must have funds sufficient to purchase the books and periodicals giving the latest word in every line of research undertaken by the college; it must have a place in which to house the library, large enough and so arranged that the books and periodicals may be quickly available. Every library, to be serviceable, must have a clear and simple system of classification and must have room to arrange by this classification, for there are too many thousands of books, bulletins, reports, etc., to depend in any degree upon the memory.

What has been the condition of our own library in view of all the above vital facts? We have been so limited in the number constituting our staff that it has been absolutely impossible to accomplish the work necessary to the growth of our library. The members of our staff have worked with the greatest interest and intensity, but it has been beyond their power to meet the demands. They would willingly have worked over time but I have not allowed this, believing that overwork impairs the poise and efficiency so necessary in a library where the second and most important factor is eager, impatient humanity—our students, teachers, and research workers.

Our funds for the past two years have been so limited that it has been impossible to furnish the latest books on the subjects germane to our college work. So far as it has been in our power we have minimized this evil by borrowing of the United States Department of Agriculture library, and other scientific libraries.

We have been unable to do the binding which preserves our valuable periodicals, bulletins, and reports, which in this library are perhaps the most precious material we have.

But the feature which has been by far the greatest hindrance to our efficiency, is our lack of a library building. We are housed, as you know, mainly in the class rooms of the second floor of the Administration building. The old chapel, entirely inadequate to house those wishing to come to the library for reference work, constitutes our reading room. Our books are scattered around in four of what were class rooms, on the second floor, and down a long flight of stairs in another class room on the first floor, our government documents are shelved to the ceiling



around one of the rooms occupied by the Registrar's office. Above I used the formidable (to a librarian), word "scattered." In spite of all our knowledge of the vital necessity of classified, orderly, logical arrangement, our books are in little better shape than scattered, for we are obliged to arrange them always with a view to weight. Our walls and floors were not built for the weight of a library; therefore the greatest care must be exercised in shelving; and logical arrangement, though vital to good service, must be a secondary consideration. In addition, we have now reached the safety limit of weight allowed by the engineers, as there are no more rooms available on the first floor, even if we could endure such further hampering of our service. The most serious feature of the whole situation is that we are housing our almost invaluable collection of library material, much of which, in case of loss, could not be replaced, and which should be within fire-proof walls, in a building that, by the slightest accident, may go up in flames. It looks as if we had come to the place where it was no longer permissible to discuss the need of a library building, but where we must act at once. We cannot stop our library's growth, we might as well close our class room doors and our research laboratories.

I am aware that I have put the needs of the library strongly, but you keep in sufficiently close touch with every department to know that I have not in any degree overstated the case. I am also aware that this report may seem almost pessimistic in tone; but if so, it is because I am so deeply impressed by the tremendous opportunity of service which our College presents with its large and growing student body and its invaluable research departments, and with the responsibility which this opportunity forces upon us.

Respectfully submitted,

IDA A. KIDDER,  
Librarian of the College.

## REPORT OF THE REGISTRAR

To the President of the College,

Sir: I have the honor to submit my report as Registrar of the College for the biennium 1914-16. While it is true that the data tables below do not show as large an increase in student enrollment in the long courses for the biennium as during preceding bienniums it is worthy of note that during the same period many of the leading colleges reported a decrease in student enrollment, while figures here show a two percent increase. Most of the institutions of this type with no increase in enrollment reported a decrease in the two departments of Engineering and Agriculture. Our increase in these two departments for the biennium shows five percent and one-and-six-tenths percent, respectively.

**Table I. Comparative Statement Showing Classification as to Courses.**  
(All duplicates excluded)

Departments	36 Weeks Courses		Total	
	1914-15	1915-16	1914-15	1915-16
Agriculture .....	547	556	547	556
Forestry .....	83	76	83	76
Home Economics .....	371	354	371	354
Engineering and Industrial Arts.....	297	312	297	312
Pharmacy .....	61	69	61	69
Commerce .....	170	177	170	177
Optional .....	27	53	27	53
Music Only .....	73	66	73	66
Summer School .....			208	237
Winter Short Courses.....			2339	1365
Totals .....	1629	1663	4176	3265

**Table II. Matriculates Classified as to Sex and Departments.**

Departments	1914-15			1915-16		
	Men	Women	Total	Men	Women	Total
Agriculture .....	540	7	547	550	6	556
Forestry .....	83		83	76		76
Home Economics .....		371	371		354	354
Engineering and Industrial Arts.....	297		297	312		312
Commerce .....	116	54	170	131	46	177
Pharmacy .....	54	7	61	60	9	69
Optional .....	6	21	27	3	50	53
Summer School .....	75	133	208	95	142	237
Music .....	16	57	73	12	54	66
Winter Short Courses.....	1405	934	2339	793	572	1365
Totals .....	2592	1584	4176	2032	1233	3265

**Table III. Distribution of Students by Collegiate Rank or Year.**

Classification	1914-15	1915-16
Graduates .....	39	51
Seniors .....	229	298
Juniors .....	298	194
Sophomores .....	227	298
Freshmen .....	436	418
Optional .....	27	53
Special .....	116	182
Vocational .....	184	103
Music .....	73	66
Winter Short Courses .....	2339	1365
Summer Session .....	208	237
.....	4176	3265

Table IV suggests the class of students taking advantage of the Vocational courses introduced during the present biennium. The ages of these students taking the regular long-course work ranged from sixteen to fifty-five years, with an average age, as shown by the table, of twenty and seven-tenths or almost two years in advance of the average graduate of a four-years high school course in the state.

Table IV. Average Age of Regular Students.

	1914-15	1915-16
Vocational Students .....	20.5	20.7
College Students .....	19.8	22
Senior Class .....	24	23

The distribution of students throughout the state is very general. Every county in the state has been represented by regular long-course students during each of the two years. During 1915-16 two counties sent over two hundred students each, eleven sent over thirty each and ten counties were represented by ten or more matriculates. It is worthy of note also that during these years students came to the College from forty-two other states or territories and eighteen foreign countries.

Table V. Distribution of Students by Residence.

(All duplicates excluded.)

Oregon Counties	36 Weeks Courses		Short Courses		Total	
	1914-15	1915-16	1914-15	1915-16	1914-15	1915-16
Baker .....	14	15		3	21	18
Benton .....	281	322	1620	764	1901	1086
Clackamas .....	43	33	22	15	65	48
Clatsop .....	22	21	8	8	30	29
Columbia .....	11	10	6	3	17	13
Coos .....	14	15	15	13	29	28
Crook .....	11	11	4	5	15	16
Curry .....	1	1	1	3	2	4
Douglas .....	26	31	18	15	44	46
Gilliam .....	6	7	5	6	11	13
Grant .....	4	2	1	4	5	6
Harney .....	9	9	5	2	14	11
Hood River .....	13	14	6	14	19	28
Jackson .....	39	33	27	11	66	44
Josephine .....	18	14	13	7	31	21
Klamath .....	10	14	2	5	12	19
Lake .....	7	4	1	1	8	5
Lane .....	43	38	85	70	128	108
Lincoln .....	10	5	17	6	27	11
Linn .....	46	46	151	136	197	182
Malheur .....	9	10	2	2	11	12
Marion .....	64	78	88	94	152	172
Morrow .....	6	5	7	16	13	21
Multnomah .....	253	214	124	120	377	334
Polk .....	25	36	79	61	104	97
Sherman .....	14	8	4	7	18	15
Tillamook .....	6	7	10	1	16	8
Umatilla .....	27	33	17	15	44	48
Union .....	37	33	11	5	48	38
Wallowa .....	16	6	3	2	19	8
Wasco .....	25	14	9	20	34	34
Washington .....	29	32	42	19	71	51
Wheeler .....	7	9		2	7	11
Yamhill .....	44	55	34	43	78	98
Totals .....	1190	1185	2444	1498	3634	2683



## DISTRIBUTION BY RESIDENCE (Continued.)

States and Territories	36 Weeks	Courses	Short	Courses	Total	
	1914-15	1915-16	1914-15	1915-16	1914-15	1915-16
Alaska .....	4	9			4	9
Arizona .....	1				2	
California .....	127	135	16	20	143	155
Colorado .....	9	7	1	2	10	9
Connecticut .....	2	2		1	2	3
Florida .....	1	1	1	1	2	2
Georgia .....		1	1	1	1	2
Idaho .....	32	49	9	5	41	54
Illinois .....	14	11	2	2	16	13
Indiana .....	10	6	2	4	12	10
Iowa .....	6	8			6	8
Kansas .....	9	7	1	3	10	10
Kentucky .....	4	1			4	1
Louisiana .....				2		2
Maine .....		2				2
Maryland .....	1				1	
Massachusetts .....	6	4	3	2	9	6
Michigan .....	2	6	1		3	6
Minnesota .....	4	7	4	1	8	8
Mississippi .....	1				1	
Missouri .....	1	6	1	2	2	8
Montana .....	8	7	2	1	10	8
Nebraska .....	5	1			5	1
Nevada .....			1		1	
New Hampshire .....	1	1			1	1
New Jersey .....	1	2			1	2
New Mexico .....	2				2	
New York .....	10	11	3	1	13	12
North Dakota .....	5	3	2	3	7	6
Ohio .....	6	9	1	2	7	11
Oklahoma .....	5	3			5	3
Pennsylvania .....	5	5			5	5
South Dakota .....	1				1	
Tennessee .....		1				1
Texas .....	4	1			4	1
Utah .....		4	2		2	4
Vermont .....	3	1			3	1
Virginia .....	2	1			2	1
Washington .....	106	123	27	39	133	162
Washington, D. C. ....			1		1	
Wisconsin .....	3	5		2	3	7
Wyoming .....	2	1			2	1
	403	441	82	94	485	535

## DISTRIBUTION BY RESIDENCES (Continued.)

Foreign Countries	36 Weeks	Courses	Short	Courses	Total	
	1914-15	1915-16	1914-15	1915-16	1914-15	1915-16
Australia .....		2				2
Canada .....	12	6	8	7	20	13
China .....	4	6		2	4	8
Denmark .....	2		1		3	
England .....	1	3			1	3
Germany .....		1				1
Greece .....	1				1	
Hawaii .....	6	1	2		8	1
Holland .....			1		1	
India .....	4	9	1		5	9
Ireland .....	1				1	
Japan .....	2	3	7		9	3
Norway .....		1				1
Philippine Islands.....	1		1	1	2	1
Porto Rico.....	1				1	
Russia .....	1	2			1	2
Scotland .....		1				1
Sweden .....		2				2
Totals .....	36	37	21	10	57	47
Oregon Counties .....	1190	1185	2444	1498	3634	2683
States and Territories..	403	441	82	94	485	535
Foreign Countries.....	36	37	21	10	57	47
Grand Total.....	1629	1663	2547	1602	4176	3265

During the two years 1914 to 1916 the College granted five hundred twenty-four degrees and awarded eight-six certificates and diplomas. In 1916 the Baccalaureate degrees alone represented twenty-four major divisions and the graduating class of that year was three times larger than the graduating class of only three years ago.

There is a rapidly growing demand for graduate work in the various departments. During the past year we had fifty-five students registered in the graduate year and seventeen of these received their advanced degrees, while only three years ago we had only eighteen students so registered and granted only three advanced degrees for that year.

**Table VI. Degrees Conferred and Certificates Granted.**

	1914-15			1915-16		
	Men	Women	Total	Men	Women	Total
Master of Science in						
Agriculture .....	11	1	12	14	1	15
Home Economics....		2	2		2	2
Bachelor of Science in						
Agriculture .....	81	1	82	105	1	106
Forestry .....	10		10	8		8
Home Economics....		64	64		83	83
Engineering .....	37		37	46		46
Commerce .....	9	11	20	12	5	17
Pharmacy .....	8	2	10	7	3	10
Total Degrees....	156	81	237	192	95	287
Certificate in						
2-year Phar. course..	4	1	5	2	1	3
Agriculture .....	26		26	8		8
Dairy Husbandry....				5		5
Home Economics....		10	10		9	9
Commerce .....	2		2	2	2	4
Mechanical Arts.....				4		4
Diploma in Music.....		9	9		1	1
Grand Totals.....	188	101	289	213	108	321

**Table VII. Colleges, Universities, and Normal Schools from Which Members of the Graduating Classes for the Past Two Years Transferred to the Oregon Agricultural College**

Universities and Colleges	1915	1916
University of California.....	2	
University of Colorado.....		1
University of Denver.....	1	
University of Idaho.....	1	
University of Minnesota.....	3	
University of Nebraska.....	1	1
University of Oregon.....	4	5
University of Puget Sound.....		3
University of Washington.....	1	5
University of Wisconsin.....	2	
Colorado Agricultural College.....		1
Columbia University, New York.....		1
Connecticut Agricultural College.....		1
Drake University.....		1
Iowa State College.....		1
Michigan Agricultural College.....	1	
Montana Agricultural College.....	1	
Occidental College (California).....	2	1
Oklahoma Agricultural College.....	5	1
Ontario Agricultural College.....		2
Pennsylvania State College.....	1	
Philomath College.....	1	
Polytechnic College of Engineering (Oakland, Cal.).....		1
Pomona College .....	1	1

Purdue University .....	1			
Reed College .....	1			
Rensselaer Polytechnic, New York.....			1	
Stout Institute.....	1			
Tilton Seminary, New Hampshire.....			1	
Washington State College.....			1	
Wesleyan University (Kansas).....	1			
Whitworth College .....			1	
Whitman College .....			2	
Willamette University .....	2	33	2	34
<hr/>				
Normal Schools				
California State Normal, Los Angeles, Calif.....			1	
Oregon State Normal.....	1			
Washington State Normal.....	2			
Wisconsin State Normal.....	1	4		1
Totals .....		37		35

### Occupations of Parents or Guardians

At the time students register at the College there appears among other questions on the registration card, one asking for the occupation of parent or guardian. It is true that replies to this question are somewhat unsatisfactory as some students report merely "merchant," "manager," "manufacturer," etc., without further explicit specification. Yet the information is sufficiently clear to indicate to what extent the various economic classes contribute to our student population and it shows the distinctly democratic character of our student body. Information showing the occupations of parents or guardians was compiled, not for the biennium, but for the one year only of 1915-16, since for such information there would be no material or significant variation in two-years time. An analysis of 1306 replies, which were sufficiently explicit to be used, shows that seven rather distinct occupational groups are represented by fifty or more students each. They are:

Engineering .....	51
Financial or Semi-legal.....	72
Unskilled labor.....	74
Skilled labor.....	88
Professional .....	113
Mercantile .....	152
Agricultural .....	565

The remaining number of these 1306 students came from homes represented by a very wide range of occupations such as clerical, publisher, jail guard, dressmaker, marine captain, photographer, cook, social worker, mail carrier, city official, civil service, milliner, etc. Thirty-one were designated as lumbermen and twenty-three as manufacturers.

### Scope of College Curriculum As Shown By Courses Offered

The table below summarizes the courses offered during the two years 1914-16 as described in the official catalogues for those years. In a few instances courses are listed in the catalogue but marked "not given" in such and such year. Such courses are not included in this tabulation which is intended to show only courses taught during the time in question. It perhaps should be mentioned, however, that the several courses omitted because of such designation are not merely "catalogue announcements" but rather they are courses which by their very nature



should be given to only a special class of interested students and to those students at a particular time in their course; hence the omission of these courses during alternate years.

The fact also should be emphasized that the table below is not intended to indicate the amount of actual instruction given in the several departments; first, because each course is listed only once regardless of whether or not it continues through one or both semesters of the school year; and second, because no attempt is made to distinguish between the courses which meet only once a week, one hour a day, and the ones which meet several times a week and several hours a day. The table does serve, however, to indicate the broad scope of work covered by the several departments of the institution, there being 741 courses offered in 1914-15 and 779 in 1915-16, exclusive of Winter Short Course work.

**Table VIII. Courses Offered 1914-15 and 1915-16.**

AGRICULTURE				
	1914-15		1915-16	
Agronomy				
Soils .....	9		10	
Field Crops .....	11		11	
Drainage and Irrigation .....	10		9	
Farm Mechanics .....	7		7	
Farm Management .....	7	44	7	44
	—		—	
Animal Husbandry .....	17			20
Dairy Husbandry .....	20			23
Horticulture				
Pomology .....	13		13	
Vegetable Gardening .....	5		5	
Landscape Gardening .....	7		7	
Floriculture .....	6		6	
By-products .....	1		1	
Research .....	3	35	3	35
	—		—	
Poultry Husbandry .....	7			6
Veterinary Medicine .....	9			9
Bacteriology .....	15			15
Botany and Plant Pathology.....	20			20
Zoology .....	17			17
Entomology .....	8			9
	—		—	
Totals .....			192	198
FORESTRY				
Forestry .....			27	29
HOME ECONOMICS				
Domestic Science .....	23			21
Domestic Art .....	14			13
	—		—	
Totals .....			37	34
ENGINEERING AND MECHANIC ARTS				
Civil and Highway Engineering.....	25			23
Electrical Engineering .....	15			19
Mechanical Engineering .....	18			18
Experimental Engineering .....	18			19
Irrigation Engineering .....	10			12
Industrial Arts .....	29			31
	—		—	
Totals .....			115	122
MINES				
Geology .....	20			20
Ceramics .....	8			8
Chemical Engineering .....	9			9
	—		—	
Totals .....			37	37

COMMERCE			
Commerce .....	21	21	
Economics .....	24	24	
Political Science .....	9	11	
Stenography and Office Training.....	7	6	
Totals .....	61	65	
PHARMACY			
Pharmacy .....	8	14	
INDUSTRIAL EDUCATION			
Industrial Education .....	15	16	
ART AND ARCHITECTURE			
Art .....	15	11	
Architecture .....	18	14	
Totals .....	33	25	
CHEMISTRY			
Chemistry .....	33	37	
ENGLISH LANGUAGE AND LITERATURE			
English .....	22	25	
HISTORY			
History .....	8	8	
LIBRARY			
Library .....	1	1	
MATHEMATICS			
Mathematics .....	22	24	
MODERN LANGUAGES			
French .....	6	3	
German .....	6	6	
Spanish .....	5	3	
Totals .....	17	12	
PHYSICS			
Physics .....	10	9	
PHYSICAL EDUCATION			
For Men .....	4	5	
For Women .....	4	3	
Elective Courses for Women.....	19	19	
Totals .....	27	27	
MILITARY			
Military .....	8	8	
MUSIC			
Music .....	13	18	
SUMMER SCHOOL			
All departments .....	50	70	
Total number of courses offered..	741	779	

Table IX. Graduates 1915.

## MASTER OF SCIENCE DEGREES

## AGRICULTURE

Leonard John Allen, Cove, Union.

Joe Miles Boothe, Union, Union.

Walter Frank Broich, Big Stone City, S. Dak.

Jesse Harrison Corsaut, Salina, Kansas.

Brooke Hukill, Corvallis, Benton.  
 Harold Wilson Hyland, Weymouth, Massachusetts.  
 Roy Edgar Marshall, Lincoln, Nebraska.  
 Gilbert Bradley Posey, Riverside, Maryland.  
 Christopher Marion Scherer, Brookville, Indiana.  
 John Earl Watt, Anthony, Kansas.

#### HOME ECONOMICS

Harriett Barbara Gardner, Lincoln, Illinois.  
 Belle Kate Mattley, Oregon City, Clackamas.

#### BACHELOR OF SCIENCE DEGREES

##### AGRICULTURE

James Marcus Alcorn, Brownsville, Linn.  
 Isaac Milton Compton Anderson, Drewsey, Harney.  
 James Obye Beck, Boise, Idaho.  
 Howard Clair Belton, Gardena, California.  
 Clarence Milton Bixby, Freewater, Umatilla.  
 Ralph Bowers, Seattle, Washington State.  
 Ellis Brown, New Era, Clackamas.  
 Clytie Laurel Cadwell, Seattle, Washington State.  
 Horace Albert Cardinell, Portland, Multnomah.  
 Richard Burton Case, Portland, Multnomah.  
 Joseph William Chambers, Jr., Newberg, Yamhill.  
 Ralph Garfield Chenault, La Grande, Union.  
 William Hadaway Coahran, Summitville, Indiana.  
 Wayne Walter Coe, Portland, Multnomah.  
 Albert Cole, Pasadena, California.  
 Asa Paul Craig, Enterprise, Wallowa.  
 Hartzell Crosby, Sherwood, Washington.  
 Elmer Crumley, National City, California.  
 Hiram Meyrick Currey, Ontario, Malheur.  
 Roland Edward Curtis, Claremont, California.  
 Willis Robert Dallas, Corvallis, Benton.  
 Garington George Dewey, Los Angeles, California.  
 Frank John Dietsch, Days Creek, Douglas.  
 Earl DeWitt Doxsee, Brownsville, Linn.  
 Theodore Alfred Ellestad, Central Point, Jackson.  
 Charles Bartlett Flanagan, Marshfield, Coos.  
 Charles Plummer Flegel, Portland, Multnomah.  
 John Walter Flint, Poway, California.  
 John Franklin Forbis, Jr., Dille, Washington.  
 Robert Grey Fowler, Carlton, Yamhill.  
 Arthur Frank, South Bend, Indiana.  
 Erskine Meade Gall, Santa Ana, California.  
 William Benson Gardiner, Colorado Springs, Colorado.  
 Edward Geary, Portland, Multnomah.  
 Louis Gustave Oswald Gentner, Portland, Multnomah.  
 Henry Gilbert, Salem, Marion.  
 Ray Elbert Goble, Ferndale, California.  
 George Hardman, Ontario, Malheur.  
 Allen Harrison, Brownsville, Linn.  
 Oliver Bliss Haves, Pasadena, California.  
 Charles Edwin Hill, West Springfield, Massachusetts.  
 Guy Hobgood, Madisonville, Kentucky.  
 Dwight Jamison, Corvallis, Benton.



Lewis Ross Johnson, Bloomington, Illinois.  
 William Theodore Johnston, Moro, Sherman.  
 Reinhold Klinghammer, Elgin, Union.  
 Hubert Edson Koons, Orland, California.  
 Ernest Herman Lafky, La Grande, Union.  
 Emery Dudley Lake, Eugene, Lane.  
 Claude Fredrick Loosley, Fort Klamath, Klamath.  
 William Arthur Lutz, Santa Ana, California.  
 James Luther McGinnis, Corvallis, Benton.  
 William Maxfield Macpherson, Pasadena, California.  
 Arthur Gordon Markham, Rochester, New York.  
 Paul Mehl, Corvallis, Benton.  
 Roy Edmund Miller, Spokane, Washington State.  
 Forrest Lester Moe, Hood River, Hood River.  
 Jesse William Moore, Harrisburg, Linn.  
 Foster McKinley Murphy, Evanston, Illinois.  
 Kenneth Nielsen, Eugene, Lane.  
 Carl Albin Noren, Reedley, California.  
 Jens Olsen, Milwaukie, Clackamas.  
 John Howard Paine, Portland, Multnomah.  
 Lee Edward Reynolds, La Grande, Union.  
 Glen Roberts, Cove, Union.  
 Amos Scofield, Azusa, California.  
 James Niven Shaw, Aberdeen, Washington State.  
 George Mahlon Stambach, Pasadena, California.  
 Avery Steinmetz, Portland, Multnomah.  
 Clayton Preston Strain, Pendleton, Umatilla.  
 Harold William Tinker, Corvallis, Benton.  
 Roy Edison Vanderwall, Haines, Baker.  
 Robert Laurie Waddell, Long Beach, California.  
 Douglas Holmes Warner, Portland, Multnomah.  
 William Edwin Whitehouse, Somerville, Massachusetts.  
 Mitchell Wilkins, Coburg, Lane.  
 John Floyd Williams, Cove, Union.  
 James Albert Wilson, North Powder, Union.  
 Everett Stanton Wisdom, Portland, Multnomah.  
 Byron Charles Wright, Portland, Multnomah.  
 Ralph VanFossen Wright, Croton, Ohio.  
 Arthur Emil Zwicker, Portland, Multnomah.

#### FORESTRY

Edward Grenville Bates, Williamsport, Pennsylvania.  
 Robert Silsby Blackden, Ashland, Jackson.  
 Willard Joseph Chamberlain, Corvallis, Benton.  
 Raymond Herald Chapler, Salem, Marion.  
 Robert John Chrisman, Danville, Ky.  
 Ernest Chase, Corvallis, Benton.  
 Benjamin Christian Culver, The Dalles, Wasco.  
 Henry Carl Deutsch, Portland, Multnomah.  
 Royce Franklin Wendover, Stockton, Kansas.

#### LOGGING ENGINEERING

Edmund Gill Andersen, Albany, Linn.

#### HOME ECONOMICS

Ada Alderton, Portland, Multnomah.  
 Helen Rae Allworth, Crawford, Washington State.  
 Ruth Marie Amesbury, Portland, Multnomah.  
 Helen Best Anderson, Portland, Multnomah.  
 Marie Anthony, McMinnville, Yamhill.

Indiana Ault, Enterprise, Wallowa.  
Elva Lovina Beals, Corvallis, Benton.  
Thurza Boies, Corvallis, Benton.  
Inez Bozorth, Bay City, Tillamook.  
Mildred Florence Brockman, Weiser, Idaho.  
Amelia Earle Burns, Spokane, Washington State.  
Frances Lucile Chase, Salem, Marion.  
Hazel Kitty Clark, Pratt, Kansas.  
Grace Elizabeth Cole, Portland, Multnomah.  
Evelyn Conklin, Grants Pass, Josephine.  
Abbie Rozella Coon, Corvallis, Benton.  
Erma Melinda Craine, Bandon, Coos.  
Edith Crockatt, Pendleton, Umatilla.  
Jennie Margaret Cunning, Baker, Baker.  
Margaret Laura Davisson, Central Point, Jackson.  
Lydia Doolittle, Corvallis, Benton.  
Mildred Augusta Hall, Corvallis, Benton.  
Beneta Kareen Hansen, Portland, Multnomah.  
Sylvia Anna Hardman, Portland, Multnomah.  
Jessie Altje Harritt, Salem, Marion.  
Willia Winifred Hawley, Corvallis, Benton.  
Laura Belle Heath, Corvallis, Benton.  
Bertha May Hendrick, Silverwood, Michigan.  
Jessie Ruth Hill, Eugene, Lane.  
Iona Margaret Irving, Corvallis, Benton.  
Clara Winifred King, Corvallis, Benton.  
Katherine Kookan, Ellensburg, Washington State.  
Sarah Morris Lee, Rainier, Columbia.  
Kathleen Lyster, Gardiner, Douglas.  
Hazel Powers McBurney, Corvallis, Benton.  
Katherine McDermott, Portland, Multnomah.  
Mary Ellen McDermott, Portland, Multnomah.  
Ailie McDonald, Corvallis, Benton.  
Melissa Margaret Martin, Corvallis, Benton.  
Julia Marvin, Enterprise, Wallowa.  
Julia Berenguella Miller, Amity, Yamhill.  
Edna Lola Mills, Forest Grove, Washington.  
Grace Elizabeth Mitchell, Medford, Jackson.  
Lorene Augusta Parker, Salem, Marion.  
Emma Winifred Patterson, Corvallis, Benton.  
Leora Philippi, Early, Gilliam.  
Anna Boyd Russell, Portland, Multnomah.  
Anna Neave Rutledge, Corvallis, Benton.  
June Seeley, Independence, Polk.  
Mildred Helen Soden, Portland, Multnomah.  
Lena May Steusloff, Salem, Marion.  
Janet Finlayson Stirling, Burns, Harney.  
Iva Mae Stokes, Eugene, Lane.  
Nellie Stubblefield, Enterprise, Wallowa.  
May Jeanette Sutherland, Honolulu, Hawaii.  
Anna Grace Sweeney, Grants Pass, Josephine.  
Elvia Wain Tagg, Warrenton, Clatsop.  
Teresa Belle Thrift, Coquille, Coos.  
Lulu Oleta Tuttle, Boulder, Montana.  
Katherine Warner, Portland, Multnomah.  
Wanda Weniger, Corvallis, Benton.  
Margaret Clementine Wiest, Bend, Crook.  
Ethel Grace Yates, Salem, Marion.  
Faith Irene Young, Boring, Clackamas.

## CIVIL AND IRRIGATION ENGINEERING

Walter Winfred Larsen, Laurel, Washington.

## CIVIL ENGINEERING

Frank Peter Amort, Orland, California.  
John Oscar Baker, Portland, Multnomah.  
Walter Carson, Hermiston, Umatilla.  
Arthur Clarence Clark, St. Johns, Multnomah.  
Arnold Alvin Clausen, The Dalles, Wasco.  
Raymond Mower Conner, Corvallis, Benton.  
Ralph Coulter Day, Portland, Multnomah.  
George Evans Hopkins, Corvallis, Benton.  
Harry Lee Hubbard, Rickreall, Polk.  
Clifford George Polk, Corvallis, Benton.  
Fay Oakley Suffron, Paso Robles, California.

## ELECTRICAL ENGINEERING

Alston Conway Archbold, Jr., Hillsboro, Washington.  
Harry Ehrman, Junction City, Lane.  
Walter Fred Gildner, Astoria, Clatsop.  
Wesley Grasle, Milwaukie, Clackamas.  
Frank Vincent Hadrys, Portland, Multnomah.  
Charles Ernest Oakes, Corvallis, Benton.  
Irl Louis Olmstead, Enterprise, Wallowa.  
Hubert Tadlock, Corvallis, Benton.  
George Randolph Thomas, Portland, Multnomah.  
William Tracy Wade, Portland, Multnomah.

## MECHANICAL ENGINEERING

Leland David Corl, Corvallis, Benton.  
Marion Samuel Hewitt, Stockton, California.  
Rowe Davis Kennedy, Corvallis, Benton.  
Leo Kroner, Portland, Multnomah.  
John Edgar Muck, St. Johns, Multnomah.  
Fairfax Hayes Parrish, Corvallis, Benton.  
Robert Savage, Salem, Marion.  
Alfred Earl Young, Portland, Multnomah.

## INDUSTRIAL ARTS

William Earl Dolde, Guthrie, Oklahoma.  
Oscar William James, Robinet, Baker.  
Luther Andrew King, Cottage Grove, Lane.  
Jesse Motley, Cove, Union.

## MINING ENGINEERING

Arthur Gilmour Mather, Clackamas, Clackamas.  
Carl Venstrand, Portland, Multnomah.  
Edward Zimmerman, Yamhill, Yamhill.

## COMMERCE

Otto Ballhorn, Woodland, Washington State.  
Lillian Burns, Spokane, Washington State.  
Evelyn Carlson, Portland, Multnomah.  
Kathryn Corbin, Portland, Multnomah.  
Leogrand DeHart Crouter, Union, Union.  
Allan Taylor Fletcher, Buell, Polk.  
Earl John Fraley, Ashland, Jackson.  
Margaret May Hanson, Corvallis, Benton.  
Arthur Absalom Harriman, The Dalles, Wasco.  
Edna Cornelius Harriman, The Dalles, Wasco.  
Nellie Hanford Harriman, The Dalles, Wasco.



Mary Hawley, Corvallis, Benton.  
 Matilda Frances Humason, Spokane, Washington.  
 Enid Glenda Leeper, Corvallis, Benton.  
 Chester Arthur Riley, Enterprise, Wallowa.  
 Henry Woodruff Russell, Marshfield, Coos.  
 John Sather, Bend, Crook.  
 Verna Tagg, Warrenton, Clatsop.  
 Zetta Underwood, Lebanon, Linn.  
 Charles Jacob Williamson, Corvallis, Benton.

#### PHARMACY

Irwin Leonard Betzel, Portland Multnomah.  
 Stella Eloise Dean, Castle Rock, Washington State.  
 Carl Augustus Fryer, Shaw, Marion.  
 Clarence Clyde Gaylord, Baker, Baker.  
 Carmen Ercil Hittson, Medford, Jackson.  
 Victor Hugo Leweaux, Portland, Multnomah.  
 Curran Lane McFadden, Corvallis, Benton.  
 Simeon Charles Smith, Portland, Multnomah.  
 Nicholas Linn Tartar, Corvallis, Oregon.  
 Elmer Tucker, Weston, Umatilla.

#### OTHER DEGREES AND DIPLOMAS

##### GRADUATES IN PHARMACY

Charles William Bent, Corvallis, Benton.  
 Beryl Vivian Camp, Portland, Multnomah.  
 James Edgar Chinn, Star, Idaho.  
 William Hamilton, La Grande, Union.  
 James Carlton Shirley, McMinnville, Yamhill.

##### DIPLOMA SCHOOL OF MUSIC

Winifred Reba Aldrich, Corvallis, Benton.  
 Mary Eva Corrie, Corvallis, Benton.  
 Olga Otelia Norgren, Vancouver, Washington State.  
 Mary Louise Pirtle, Albany, Linn.  
 Esther Margaret South, Juntura, Malheur.  
 Lystra Alice Tagg, Warrenton, Clatsop.  
 Cora Lorraine Ueland, Roseburg, Douglas.  
 Elma Elizabeth Waugh, Toledo, Lincoln.  
 Mary Susie Williamson, Corvallis, Benton.

#### VOCATIONAL CERTIFICATES

##### AGRICULTURE

John Busenbark, Roseburg, Douglas.  
 Harry Calbom, Mount Vernon, Washington State.  
 Kenneth George Campbell, Honolulu, Hawaii.  
 Gordon Thomas Cavin, Ladysmith, British Columbia.  
 Anton Benjamin Chindgren, Mulino, Clackamas.  
 Carter Newman Daggett, Port Ludlow, Washington State.  
 Francis Daggett, Port Ludlow, Washington State.  
 Kenneth Nelson Damon, Ferndale, California.  
 Ferris Milton Green, Phoenix, Arizona.  
 Roy Edward Harp, Douglas, Nebraska.  
 William Moir Harvey, Corvallis, Benton.  
 Solomon William Hauser, Tygh Valley, Wasco.  
 Lawrence Alwin Hercher, Dillard, Douglas.  
 Harry Humfeld, Portland, Multnomah.

Wilford Imrie, Melrose, Douglas.  
 Ernest Layton, Knab, Washington State.  
 Laird Linderman, Corvallis, Benton.  
 Russell Maxfield, Payette, Idaho.  
 Harry Dale Miller, Corvallis, Benton.  
 Thomas Mitchell, Langlois, Curry.  
 William Thomas Norris, Fort Klamath, Klamath.  
 Hubert Spencer Prentice, Madison, Ohio.  
 William Sendlinger, Mosier, Wasco.  
 Wallace Smith, Corvallis, Benton.  
 Leslie Porter Trigg, Ferndale, California.  
 Edwin Moore Van Nuys, Turner, Marion.

#### HOME ECONOMICS

Ruth Anna Avery, Klamath Falls, Klamath.  
 Martha Frances Boyd, Multnomah.  
 Ara Chisum, Medford, Jackson.  
 Ada May Goutt, Tacoma, Washington State.  
 Edith Hamilton, Corvallis, Benton.  
 Fannie Fern McIntosh, Union, Union.  
 Bessie Fay Newton, Gold Hill, Jackson.  
 Angeline Neil, Ashland, Jackson.  
 Hazel Anna Nutting, Silverton, Marion.  
 Elizabeth Wahlberg, San Francisco, California.

#### COMMERCE

John Proebstel, Big Pine, California.  
 Laurence South, Juntura, Malheur.

### GRADUATES 1916

#### MASTER OF SCIENCE DEGREES

##### AGRICULTURE

James Marcus Alcorn, Corvallis, Benton.  
 James Obye Beck, Boise, Idaho.  
 Clarence Milton Bixby, Freewater, Umatilla.  
 Otto Herman Elmer, Corvallis, Benton.  
 George Hardman, Ontario, Malheur.  
 Anching Kung, Shanghai, China.  
 John Robert Magness, Amity, Yamhill.  
 Carl Morgan, Davenport, Washington.  
 Clara Manerva Nixon, Trumansburg, New York.  
 Guy Lockhart Philp, Mt. Lebanon, Penn.  
 Charles Curtis Ruth, Corvallis, Benton.  
 Carl Ephriam Schuster, Corvallis, Benton.  
 Herbert William Siefert, Corvallis, Benton.  
 Gordon Keller Van Gundia, Sycamore, Ohio.  
 Albert Franklin Yeager, Bazaar, Kansas.

##### HOME ECONOMICS

Jessie Dunlavy McComb, Corvallis, Benton.  
 Mary Whiting McFarlane, Salem, Marion.

#### BACHELOR OF SCIENCE DEGREES

##### AGRICULTURE

Herman Abraham, Albany, Linn.  
 Homer Ferris Aker, Chula Vista, California.  
 Byrd Moore Ault, Enterprise, Wallowa.

Frank Timmons Baldwin, Bakersfield, California.  
Frank Llewellyn Ballard, Meredith, New Hampshire.  
Clay Aaron Barnes, Goldendale, Washington State.  
Olin Huntington Baum, Portland, Multnomah.  
Alvin Otto Binswanger, Portland, Multnomah.  
Alexander Burr Black, Corvallis, Benton.  
Claude Hale Bryant, Gaston, Washington.  
Ralph Wilson Burns, Glendive, Montana.  
Eugene Johnson Carpenter, Ashland, Jackson.  
Russell Jeffrey Case, Vancouver, Washington State.  
Jay Russell Coffey, Portland, Multnomah.  
William Wallace Crain, Biggs, California.  
Paul Henry Crouter, Union, Union.  
Joseph Edmond Currey, Olympia, Washington State.  
Robert Herschel Davidson, Meridian, Idaho.  
Charles Elwyn Davis, Union, Union.  
Frank John Dietsch, Days Creeks, Douglas.  
Armin Meredith Doerner, Denver, Colorado.  
Harold Van Ransselaer Doolittle, Pomona, California.  
Albert Edward Engbretson, Astoria, Clatsop.  
DeVere Fendall, Newberg, Yamhill.  
Virgil Fendall, Newberg, Yamhill.  
Oscar Earl Ferguson, Helix, Umatilla.  
Arthur William Finch, Gardena, California.  
Carlos Ewing Fisk, Parma, Idaho.  
George Leslie Francis, Portland, Multnomah.  
Thomas Ernest Francis, Elmont, Virginia.  
Victor Garvin, Denver, Colorado.  
Walter Henry Gerke, Portland, Multnomah.  
Mahlon Bruce Gilbert, Woodburn, Marion.  
Ray Elbert Goble, Ferndale, California.  
Francis Kellaly Greene, Aberdeen, Washington State.  
Earle Dutton Hallock, Heppner, Morrow.  
John Monroe Hamilton, National City, California.  
Paul Atwood Harvey, Cashmere, Washington State.  
Russell Noah Haverstick, Cashmere, Wash.  
Leo Horace Haw, Pendleton, Umatilla.  
Charles Albert Henderson, Auburn, California.  
Godfrey Richard Hoerner, Seattle, Washington State.  
George McLean Houliston, East Aurora, N. Y.  
Herbert Badollet Howell, Portland, Multnomah.  
Chauncey Mulks Hubbard, Corvallis, Benton.  
Merle Truman Jenkins, Corvallis, Benton.  
Miles Johns, Seattle, Washington State.  
Perry Nolan Johnston, Moro, Sherman.  
Wallace LaDue Kadderly, Portland, Multnomah.  
Frank Funn Kan, Nom Been Tong, China.  
George Lewis Kathan, Syracuse, New York.  
Walter Jacob Koenig, Rock Island, Illinois.  
Ralph Laird, Pleasant Hill, Lane.  
Howard Milton Lamb, Fossil, Wheeler.  
Thomas Ligget Lamoreux, Fort Wadsworth, New York.  
Harvey Lee Lantz, Cove, Union.  
Leo Laythe, Harriman, Harney.  
Ivan Hill Loughary, Monmouth, Polk.  
Thomas Richard McClellan, West Stayton, Marion.  
Arthur Wallace McCoy, Puallup, Washington State.  
Spencer Neff Mayhew, North Bend, Coos.  
Donald Middlekauff, Lewiston, Idaho.



Harold Middlekauff, Lewiston Idaho.  
 Mark Humbert Middlekauff, Corvallis, Benton.  
 Damon Edward Millikin, Ontario, Malheur.  
 Victor Cornwall Morgan, Winona, Minnesota.  
 Aubrey Richard Neale, Nelson, B. C., Canada.  
 Joseph Webster Newell, Portland, Multnomah.  
 Robert Tokiro Ono, Nigata, Japan.  
 Taimie Armas Parpala, Nasel, Washington State.  
 Harry Leland Percy, Portland, Multnomah.  
 Charles Kelly Powell, Fruitland, Idaho.  
 Frank Braxton Powell, Monmouth, Polk.  
 Emanuel Henry Reichart, New York City, New York.  
 Dale Everette Richards, Kalispell, Montana.  
 Henry Carl Richter, Salem, Marion.  
 Charles Hammer Roseman, Corvallis, Benton.  
 Edward Roseman, Corvallis, Benton.  
 Juemon Sato, Sado, Japan.  
 Martin Andrew Schreiber, McMinnville, Yamhill.  
 Louis William Seggel, Jersey City, New Jersey.  
 Halbert Edgerton Selby, Bellingham, Washington State.  
 Frederic Cecil Shepard, Roosevelt, Washington State.  
 Howard Smith, Los Angeles, California.  
 Eugenia Hazel Somers, Corvallis, Benton.  
 Taki Herbert Soo, Hong Kong, China.  
 Rodney Olen Soth, Toledo, Iowa.  
 Hugo Ferdinand Stoneberg, Coburg, Lane.  
 Carey, Lloyd Strome, Corvallis, Benton.  
 Harold Roy Taylor, Baker, Baker.  
 Earl Horstad Thompson, Pasadena, California.  
 Elmer Julian Thompson, Minneapolis, Minn.  
 Stewart Wendell Tulley, Wallowa, Wallowa.  
 Jesse Oland Turner, Heppner, Morrow.  
 Robert Tweed, Ashland, Jackson.  
 Edward Franklin Underwood, Boyd, Wasco.  
 Nao Uyei, Ohyodo, Japan.  
 Edgar Fred Vestal, Payette, Idaho.  
 Nelson Samuel Visel, Santa Ana, California.  
 Claude Gilbert Walker, Fairbanks, Alaska.  
 Theodore Warford Weller, Portland, Multnomah.  
 Ralph Lovell West, Westport, Clatsop.  
 Alvin Wilbur Wheeler, Ashland, Jackson.  
 Lyle Porter Wilcox, Milton, Umatilla.  
 Ira John Wolfe, Mt. Vernon, Washington State.  
 Francis DeWitt Yeager, Centralia, Washington State.

## FORESTRY

Sereno Brett, Portland, Multnomah.  
 Gustaf Wilhelm Hult, Corvallis, Benton.  
 Hans Walter Loof, Oak Harbor, Washington State.  
 Ben William Schubert, Silverton, Marion.  
 David McKinnon Wilson, Linnton, Multnomah.  
 Lee Roy Woods, Jr., Cottage Grove, Lane.

## LOGGING ENGINEERING

Harold Gilbert Archibald, Albany, Linn.  
 Frederick Aram Holmes, Enterprise, Wallowa.

## HOME ECONOMICS

Gertrude Acheson, Portland, Multnomah.  
 Merrie Ierne Ahern, Hugo, Josephine.

Ethel Allen Rickreall, Polk.  
Elmina Gladys Atwood, Corvallis, Benton.  
Helen May Austin, Aberdeen, Washington State.  
Edna Mary Bannister, Weston, Umatilla.  
Una Marguerite Barden, Missoula, Montana.  
Olive Pauline Bassett, Newberg, Yamhill.  
Agnes Beals, Corvallis, Benton.  
Olive Greene Behnke, Florence, Lane.  
Salome Solis-Cohen Bernstein, Portland, Multnomah.  
Elizabeth Bowerman, Fossil, Wheeler.  
Josephine Bracons, Portland, Multnomah.  
Irene Brandes, Portland, Multnomah.  
Grace Brewer, Portland, Multnomah.  
Zoe Agnes Brown, Seaside, Clatsop.  
Dorothy Southwick Brownell, Portland, Multnomah.  
Ina Ruth Burnell, Claremont, California.  
Murine Carroll, Junction City, Lane.  
Elsie Beulah Caspar, Union, Union.  
Alberta Cavender, Portland, Multnomah.  
Lydia Woodward Champlin, Tacoma, Washington State.  
Frances Helen Corl, Corvallis, Benton.  
Edna Frances Cornell, Grants Pass, Josephine.  
Helen Cowgill, Corvallis, Benton.  
Leffie Florence Davidson, Portland, Multnomah.  
Grace May Dinges, Corvallis, Benton.  
Maida Laura Doolittle, Corvallis, Benton.  
Harriet Foster, Corvallis, Benton.  
Dora Ann Fridley, Klondike, Sherman.  
Pearl Emmogene Gates, Corvallis, Benton.  
Manette Hanson, Corvallis, Benton.  
Martha Norden Hart, Portland, Multnomah.  
Clara Levena Hartzog, Corvallis, Benton.  
Mary Delphia Hartzog, Lakeview, Lake.  
Lucile Hayes, Portland, Multnomah.  
Cora Hewes, Albany, Linn.  
Neva Leona Hoflich, Albany, Linn.  
Helen Mabel Horning, Corvallis, Benton.  
Elizabeth Howitt, Gresham, Multnomah.  
Della Minerva Jackson, Lorane, Lane.  
Eva Inez Jackson, Portland, Multnomah.  
Minnie Kalbus, Chehalis, Washington State.  
Eva Florence Keatley, Castlerock, Washington State.  
Helen Jean Ketchum, Independence, Polk.  
Naomi Edna Kirtley, La Grande, Union.  
Florence Lillian Knight, San Luis Obispo, California.  
Vivian Maude Lane, Harrisburg, Linn.  
Anna Elizabeth McCormick, Lebanon, Linn.  
Daisy Augusta McPherson, Pendleton, Umatilla.  
Ruth Marion Mateer, Nampa, Idaho.  
Eva Miller, Fillmore, Illinois.  
Willetta Moore, Eugene, Oregon.  
Ruth Morrison, Hood River, Hood River.  
Wilmetta Emily Morse, West Lafayette, Indiana.  
Ruby Elizabeth Munford, Senecaville, Ohio.  
Geraldine Newins, Patchogue, New York.  
Ruth Newmeyer, Salem, Marion.  
Mabel Norton, Vocaville, California.  
Mary Agnes Oakes, Grants Pass, Josephine.  
Elsie Hazel Orem, Klamath Falls, Klamath.

Fern Gail Parr, Woodburn, Marion.  
Dorothy Ellen Passmore, Tualatin, Washington.  
Pauline Mary Pease, Portland Multnomah.  
Esther Plank, Woodburn, Marion.  
Genevieve Potter, Salem, Marion.  
Alice Arabella Prill, Chetek, Wisconsin.  
Ellen Madeline Rawlings, Albany, Linn.  
Harriet Rigdon, National City, California.  
Maysel Ellen Sanderson, Klamath Falls, Klamath.  
Elsie Elizabeth Schultz, Gresham, Multnomah.  
Ina Scrivner, Boise, Idaho.  
Mary Vernon Skelton, Corvallis, Benton.  
Elizabeth Hargraves Smith, Los Angeles, California.  
Wanda Muir Theobald, Silverton, Marion.  
Elsie Gay True, Sherwood, Washington.  
Winnifred Turner, Corvallis, Benton.  
Eva Estelle Walker, Florence, Lane.  
Gladys Louise Whipple, Portland, Multnomah.  
Miriam Blanche Williams, Portland, Multnomah.  
Pearl Frances Williamson, Albany, Linn.  
Ivy Emma Witzig, Corvallis, Benton.  
Sara Eleanor Yeatman, Oakland, California.

#### CIVIL ENGINEERING

Albert Alexander Amort, Corvallis, Benton.  
Bayard Buchanan, Roseburg, Douglas.  
John Henry Fraser, Parkplace, Clackamas.  
John Wesley Green, Crawfordsville, Linn.  
Calvin Arthur Jordan, Pendleton, Umatilla.  
Zane Arthur Lansdale, Weston, Umatilla.  
George Olin Lee, Maltby, Washington State.  
Jack Walker Nash, Albany, Linn.  
Willard Young Nelson, Lafayette, Yamhill.  
Roderic Pearson, Portland, Multnomah.  
Ralph William Thomas, Corvallis, Benton.  
George Sylvester Vincent, Sherwood, Washington.

#### ELECTRICAL ENGINEERING

Winifield Eckley, La Grande, Union.  
Carl Magnus Frost, Portland, Multnomah.  
Harold Nelson Hackett, Estacada, Clackamas.  
Samuel Kephart, San Francisco, California.  
William Kinderman, Kings Valley, Benton.  
Charles King, Ashland, Jackson.  
Charles Renfro, Corvallis, Benton.  
Harry Walwin Seibert, Pendleton, Umatilla.  
Victor Hammond Sinks, Portland, Multnomah.

#### HIGHWAY ENGINEERING

Fred Henry Forster, Tangent, Linn.

#### INDUSTRIAL ARTS

William Earl Dolde, Guthrie, Oklahoma.  
Walter Harold Mason, Ione, Morrow.  
Arthur Edward Turner, Union, Union.

#### MECHANICAL ENGINEERING

Arthur Aldrich Bennett, Dallas, Polk.  
Dakshina Ranjan Guha, Dacca, India.  
Harry Earl Hamilton, Portland, Multnomah.  
Edward Delta Jones, Jefferson, Marion.



Leonard Joseph Locher, Burns, Harney.  
 Ray Ben McMinn, Portland, Multnomah.  
 Roy Michelbook, McMinnville, Yamhill.  
 Merle Moore, Corvallis, Benton.  
 Orvill Greenleaf Reeves, Corvallis, Benton.  
 Allan Edwin Robson, Corvallis, Benton.  
 Frank Rohr, Astoria, Clatsop.  
 Frank Vernon Romig, McCoy, Polk.  
 Rex Tamerlane, Portland, Multnomah.  
 Rolf Theodore Wetteland, Camas, Washington State.

#### MINING ENGINEERING

George Frederick Chambers, Newberg, Yamhill.  
 Fritz Carl Floss, Milwaukie, Clackamas.  
 Clifton Fay Smith, Salem, Marion.  
 Harry Allen Sutton, Aumsville, Marion.  
 Martin Van Couvering, Riverside, California.  
 William Harp Watters, St. Helens, Columbia.

#### CHEMICAL ENGINEERING

Kenneth Lawrence Fox, Chicago, Illinois.

#### COMMERCE

Edward Christopher Allworth, Crawford, Washington State.  
 Ruth Carlson, Portland, Multnomah.  
 Arnold John Funk, Corvallis, Benton.  
 Arthur Absalom Harriman, The Dalles, Wasco.  
 Edna Cornelius Harriman, The Dalles, Wasco.  
 Nellie Hanford Harriman, The Dalles, Wasco.  
 Earl James Kingsley, Corvallis, Benton.  
 Leland Jay Knox, Fossil, Wheeler.  
 Avery Lloyd Lasswell, Portland, Multnomah.  
 Arthur Evan Logan, Escondido, California.  
 Yick Long, Canton, China.  
 Muriel Esther McHenry, Corvallis, Benton.  
 David William Minsinger, Portland, Multnomah.  
 Ira Delbert Mix, Independence, Polk.  
 Leroy Leighton Overholser, Albany, Linn.  
 Carl Leverne Story, Airlie, Polk.  
 Myra Wiglesworth, Union, Union.

#### PHARMACY

Florence Mable Cooley, Junction City, Lane.  
 Addie Isabella Downs, Coquille, Coos.  
 Albert Dickenson Foster, Dayton, Yamhill.  
 Hugh Fisher Hammerly, Albany, Linn.  
 Nathan Edwin Manock, Corvallis, Benton.  
 Ralph Russell Palmer, Grand Junction, Colorado.  
 Earl John Schuster, Corvallis, Benton.  
 Harley Rex Shields, Amity, Yamhill.  
 Charles Woodard Storz, Portland, Multnomah.  
 Fay Ernestine Waterman, Hermiston, Umatilla.

#### OTHER DEGREES AND DIPLOMAS

##### GRADUATES IN PHARMACY

Inez Cooley, Junction City, Lane.  
 George Lawrence Mickel, Corvallis, Benton.  
 Walter White, McMinnville, Yamhill.

##### DIPLOMA, SCHOOL OF MUSIC

Natalie Bemis Peabody, Castle Rock, Washington State.

## VOCATIONAL CERTIFICATES

For the successful completion of the vocational courses in Agriculture, Commerce, Dairying, Forestry, Home Making, and Mechanic Arts, varying in length from one to three years, students are granted certificates which are delivered to them as the requirements are satisfied.

## AGRICULTURE

Otto Anderson, Ilwaco, Washington State.  
Albert Hoffard, Modum, Norway.  
Richard Homer Hopper, Payette, Idaho.  
Samuel Clifford James, Rochester, Washington State.  
Clifford Johnson, Boise, Idaho.  
Alvin Hjalmar Madsen, Silverton, Marion.  
Paul Sittou, Carlton, Yamhill.  
Adam Glenn Young, Atlanta, Georgia.

## DAIRY HUSBANDRY

Calvin Alverson, La Conner, Washington State.  
Allen Archibald Hudelson, Berger, Idaho.  
Leland Lincoln Purrington, Sebastopol, California.  
John William Trigg, Ferndale, California.  
Charles Elmer White, Cato, New York.

## HOME ECONOMICS

Esther Anna Anderson, Dallas, Polk.  
Alice Marie Caldwell, Bend, Crook.  
Catherine Bruce Ferguson, Roseburg, Douglas.  
Marguerite Gale, Union, Union.  
Gladys Belle Hamilton, Corvallis, Benton.  
Linda Amelia Leisy, Salem, Marion.  
Kathleen Silver, Ashland, Jackson.  
Madeline Silver, Ashland, Jackson.  
Elsie Louisa Zosel, Salem, Marion.

## COMMERCE

Marie Amelia Abraham, Corvallis, Benton.  
Verner Branland, Colton, Clackamas.  
Eugene John Keller, Grays River, Washington State.  
Mary Kotan, Crabtree, Linn.

## MECHANIC ARTS

Melvin Herman Ellestad, Central Point, Jackson.  
Harvey Arthur Leisy, Salem, Marion.  
Carl Reinhold Samuelson, Colton, Clackamas.  
Herman Carl Stuwe, Aurora, Clackamas.

Respectfully submitted,

H. M. TENNANT,  
Registrar.

## REPORT OF THE TREASURER.

To the Honorable President and Board of Regents of the Oregon Agricultural College,

Gentlemen: Herewith I submit my report covering all financial transactions of the Oregon Agricultural College under Federal, State, and County appropriations, or special funds, for Maintenance, Buildings, Equipment, Improvements, Repairs, Library, Experiment, Educational Extension, and other scientific and educational purposes.

The report covers the Biennium beginning July 1, 1914, and closing June 30, 1916.

Respectfully submitted,

C. L. HAWLEY

Treasurer.

## DIVISION I—RESIDENT INSTRUCTION.

## State and Federal Funds.

July 1, 1914 to June 30, 1915.

## RECEIPTS

Balance July 1, 1914 (Maintenance Fund) .....	\$ 77,751.08
Balance July 1, 1914 (Land Grant Fund) .....	3,054.59
Balance July 1, 1914 (Col. Miscel. Fund) .....	13,245.63
Miscellaneous receipts .....	52,314.09
State Maintenance appropriation .....	50,000.00
Millage Tax (First half 1915) .....	186,482.65
Land Grant interest .....	11,267.08
Morrill, Nelson Fund, Federal .....	50,000.00

Total receipts and balances ..... \$444,115.12

## DISBURSEMENTS

Salaries .....	\$223,673.25
Labor .....	34,635.39
Office Supplies .....	6,118.89
Class Supplies .....	15,806.22
Traveling Expenses .....	4,623.74
Heating .....	11,301.09
Light and Power .....	3,141.37
Water .....	1,330.25
Telephone and Telegraph .....	1,040.62
Publications and Printing .....	8,658.38
Advertising .....	3,817.16
Miscellaneous Supplies .....	10,157.68
Feeding Stuffs .....	6,914.96
Freight and Express .....	4,413.05
Library .....	55.71
Improvements .....	12,546.76
Repairs .....	1,751.82
Equipment .....	24,893.59
Livestock .....	7,954.75
Heating extensions .....	8,968.91
Rentals on buildings, land, etc. ....	1,647.39
Home Economics building .....	11,667.61
Men's Gymnasium .....	22,526.62
Live stock barn .....	1,354.20

Total Disbursements ..... \$428,999.41

Balance June 30, 1915 ..... \$ 15,115.71

Receipts from student departmental laboratory fees are expended for supplies used by the various classes in performing laboratory exercises. Receipts from farm sales are derived through the sale of the various products of the departments of the School of Agriculture and the proceeds are used for the general maintenance costs of the farms.



# REPORT OF THE TREASURER

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## State and Federal Funds.

July 1, 1915 to June 30, 1916.

### RECEIPTS

Balance July 1, 1915 (Millage Tax Fund) .....	\$ 126.46
Balance July 1, 1915 (Land Grant Interest) .....	556.15
Balance July 1, 1915 (Col. Miscel. Fund) .....	11,133.10
Miscellaneous receipts .....	44,700.54
Millage Tax (second half 1915 and first half 1916) ..	373,387.28
Land Grant Interest .....	11,059.01
Morrill, Nelson Fund .....	50,000.00

Total receipts and balances ..... \$494,262.57

### DISBURSEMENTS

Salaries .....	\$284,420.51
Labor .....	20,537.46
Office Supplies .....	3,186.56
Class Supplies .....	9,539.21
Traveling Expenses .....	3,682.81
Heating .....	15,765.38
Light and Power .....	3,925.32
Water .....	1,368.14
Telephone and Telegraph .....	2,097.67
Publications and Printing .....	6,279.98
Advertising .....	3,219.88
Miscellaneous Supplies .....	16,129.45
Feeding Stuffs .....	9,101.06
Freight and Express .....	1,559.13
Library .....	3,234.71
Improvements .....	1,981.27
Repairs .....	2,045.39
Equipment .....	11,385.37
Livestock .....	562.00
Rentals on buildings and land .....	3,426.46
Home Economics building .....	1,917.45
Men's Gymnasium .....	2,182.80
Forestry building .....	14,036.76

Total Disbursements ..... \$421,584.80

Balance June 30, 1916 ..... \$ 72,677.77

NOTE: Department fees are not included in College Miscellaneous account for fiscal year 1915-16. Receipts from products sold are used to purchase new supplies, and receipts from student departmental fees are used for the benefit of students in purchasing class supplies, etc.

## Departmental Fees.

July 1, 1915 to June 30, 1916.

### RECEIPTS

Fees for Fiscal Year ..... \$22,375.20\*

### DISBURSEMENTS

Labor .....	\$1,197.60
Office Supplies .....	8.00
Class Supplies .....	5,619.78
Traveling Expense .....	26.05
Heating .....	229.57
Publications and Printing ..	15.45
Miscellaneous Supplies .....	121.41
Freight and Express .....	115.44
Improvement .....	46.47
Repairs .....	9.00
Equipment .....	910.55
Library .....	40.61

Total Disbursements ..... \$ 8,339.93

Balance June 30, 1916 ..... \$14,035.27

\*Receipts from student departmental laboratory fees were this year segregated and accounted separately. These receipts are expended for supplies for general laboratory exercises.

## Special State Appropriation (1913).

July 1, 1914 to June 30, 1915.

## BALANCES

New Buildings .....	\$ 419.90	
Improvement and Repairs		
Heating Extension		
Science Hall .....	18.34	
Equipment .....	6,638.35	
Books, Magazines and Periodicals .....	9,342.90	
Total .....		\$16,419.49

## DISBURSEMENTS

New Buildings .....	\$ 419.90	
Improvement and Repairs		
Heating Extension		
Science Hall .....	18.34	
Equipment .....	6,638.35	
Books, Magazines and Periodicals .....	9,342.06	
Total Disbursements .....		\$16,418.65
Balance June 30, 1915 .....		\$ .84

## DIVISION II—AGRICULTURAL EXPERIMENT STATION.

## Home Station.

July 1, 1914 to June 30, 1915.

## RECEIPTS

Balance July 1, 1914, Miscellaneous Sales.....	\$ 384.87*	
Federal Appropriations		
Hatch Fund .....	15,000.00	
Adams Fund .....	15,000.00	
Miscellaneous Sales .....	525.81	
Total .....		\$30,140.94

## DISBURSEMENTS

	Hatch	Adams	Miscel.
Salaries .....	\$12,649.99	\$12,191.65	
Labor .....	755.76	110.25	
Publications .....	39.92		
Postage and Stationery .....	21.94	10.53	
Freight and Express .....	14.37	97.77	\$12.17
Heat, Light, Power, Water .....	40.71	315.96	
Chemical and Lab. Supplies.....	336.67	916.26	
Seeds and Sundry Supplies .....	95.39	244.84	15.73
Fertilizers .....			
Feeding Stuffs .....	644.56	277.40	81.50
Library .....			
Tools and Machinery .....	13.35	181.23	2.20
Furniture and Fixtures .....	33.70	42.40	8.50
Scientific Apparatus .....	233.60	421.51	
Livestock .....	48.00		
Traveling Expense .....	52.04	40.20	
Contingent Expense .....	20.00		
Building and Repairs .....		150.00	20.84
Equipment .....			
Improvements .....			
Telephone and Telegraph.....			
Printing .....			
Total Disbursements .....	\$15,000.00	\$15,000.00	\$140.94
Balance June 30, 1915 .....			\$30,140.94

\*Overdraft July 1, 1914.

# REPORT OF THE TREASURER

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## Home Station.

July 1, 1915 to June 30, 1916.

### RECEIPTS

#### Federal Appropriations

Hatch Fund .....	\$15,000.00
Adams Fund .....	15,000.00

Total .....	\$30,000.00
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### DISBURSEMENTS

	Hatch	Adams
Salaries .....	\$ 8,941.51	\$12,775.00
Labor .....	1,481.81	592.67
Publications .....	689.28	.....
Postage and Stationery .....	592.12	35
Freight and Express .....	89.82	75.79
Heat, Light, Power, Water .....	51.52	134.42
Chemical and Lab. Supplies .....	241.32	564.53
Seeds and Sundry Supplies .....	153.97	110.55
Fertilizers .....	.....	.....
Feeding Stuffs .....	1,663.68	226.25
Library .....	5.90	26.18
Tools, Machinery .....	68.25	126.15
Furniture and Fixtures .....	148.13	10.24
Scientific Apparatus .....	26.00	239.50
Livestock .....	3.00	.....
Traveling Expense .....	784.44	118.37
Contingent Expense .....	33.90	.....
Building and Repairs .....	25.35	.....

Total Disbursements .....	\$15,000.00	\$15,000.00	\$30,000.00
Balance June 30, 1916 .....			.....

## Home Station.

October 1, 1914 to December 31, 1914.

### RECEIPTS—State Appropriations

#### Crop and Fruit Pest

Balance October 1, 1914.....	\$6,358.55
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#### Scientific Investigation

Balance October 1, 1914.....	2,834.75
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Total .....	\$9,193.30
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### DISBURSEMENTS

	Crop and Fruit Pest	Scientific Investigations
Salaries .....	\$2,797.01	\$ 850.01
Labor .....	149.64	179.39
Publications .....	133.86	783.93
Postage and Stationery .....	63.24	220.50
Telephone and Telegraph .....	8.95	18.75
Freight and Express .....	2.00	.....
Chemical and Lab. Supplies .....	145.19	168.03
Seeds and Sundry Supplies .....	91.67	34.59
Feeding Stuffs .....	.....	26.00
Library .....	15.61	.....
Tools, Machinery .....	51.79	.....
Furniture, Fixtures .....	2.50	136.19
Scientific Apparatus .....	159.12	45.00
Traveling Expenses .....	200.00	208.30
Building and Repairs .....	.....	15.00

Total .....	\$3,820.58	\$2,685.69	\$6,506.27
Balances December 31, 1914.....	\$2,537.97	\$ 149.06	\$2,687.03



## OREGON AGRICULTURAL COLLEGE

## Home Station.

January 1, 1915 to June 30, 1916.

## RECEIPTS—State Appropriations

Crop and Fruit Pest	
Balance January 1, 1915.....	\$ 2,537.97
Crop and Fruit Pest Appropriation.....	15,000.00
Scientific Investigation	
Balance January 1, 1915 .....	149.06
Scientific Investigation Appropriation .....	10,000.00

Total ..... \$27,687.03

## DISBURSEMENTS

	Crop and Fruit Pest	Scientific Investigations
Salaries .....	\$ 7,645.27	\$ 3,683.57
Labor .....	2,355.89	786.60
Publications .....	3,925.80	1,377.38
Postage and Stationery .....	155.61	425.12
Telephone and Telegraph .....	12.16	25.35
Freight and Express .....	125.66	33.51
Heat, Light, Water and Power .....	22.26	
Chemical and Lab. Supplies .....	641.90	149.72
Seeds, Sundry Supplies .....	559.74	418.60
Fertilizers .....	2.60	
Feeding Stuffs .....		1,741.86
Library .....	265.49	3.00
Tools, Machinery .....	45.30	127.94
Furniture and Fixtures .....	79.10	12.83
Scientific Apparatus .....	192.85	484.11
Livestock .....		60.00
Traveling Expenses .....	911.60	559.69
Building and Repairs .....	227.00	141.89

Totals ..... \$17,168.23      \$10,031.17      \$27,199.40

Balance June 30, 1916 ..... \$ 369.74      \$ 117.89      \$ 487.63

## Branch Stations.

October 1, 1914 to December 31, 1914

## RECEIPTS—(Balances)

	Eastern Oregon	Umatilla Co.	Sherman Co.	Harney Co.	Sou. Oregon	Clatsop Co.	Hood Riv. Co.
State Appropriations .....	\$1,411.45	\$610.87	\$346.18	\$8.88	\$1,201.62	\$1,903.33	\$1,704.88
Federal Appropriations*							
County Appropriation							
Total .....	\$1,411.45	\$610.87	\$346.18	\$8.88	\$1,201.62	\$1,903.33	\$1,704.88

## DISBURSEMENTS

Salaries .....	\$ 215.00	\$383.32			\$ 569.91	\$ 485.00	\$ 825.91
Labor .....	192.50	83.00	\$185.40		232.22	18.71	16.25
Publications .....		.70					
Postage and Stationery..	14.40	10.52	.39		20.40		21.05
Telephone and Telegraph	10.55	3.40		\$2.90	16.75		17.35
Freight and Express.....	21.54	34.43			4 60	31.98	10.47
Heat, Light, Water and Power .....	20.75	.90	14.00		29.94		13.32
Chemical Supplies .....							25.54
Sundry Supplies .....	173.95	12.10	42.47		131.17	65.16	350.35
Feeding Stuffs .....	77.65			1.50	101.27	752.50	
Tools and Machinery .....	26.05	18.75	47.77		23.80	16.70	150.12
Furniture and Fixtures..						27.50	6.25
Livestock .....	515.65					41.50	
Scientific Apparatus .....							70.00
Traveling Expense .....	91.67	63.75	6.00		39.02	19.80	38.51
Building and Repairs.....	51.74		50.15		22.54		159.50
Total .....	\$1,411.45	\$610.87	\$346.18	\$4.40	\$1,201.62	\$1,458.85	\$1,704.62
Balance Dec. 31, 1914. ....	\$.....	\$.....	\$.....	\$4.48	\$.....	\$ 444.48	\$ .26

\*The Federal funds are disbursed direct by the Government towards salaries of superintendents or assistants; therefore the disbursements here given are from State and County appropriations only.

## Branch Stations.

January 1, 1915 to December 31, 1915

	Eastern Oregon	Umatilla Co.	Sherman Co.	Harney Co.	Sou. Oregon	Clatsop Co.	Hood Riv. Co.
Balance January 1, 1915						\$ 111.18	\$ .26
RECEIPTS—Appropriations							
State	\$7,500.00	\$3,000.00	\$2,500.00	\$4,000.00	\$5,000.00	\$3,000.00	\$2,250.00
Federal*		3,000.00	3,500.00	1,200.00			
County							2,000.00
Total	\$7,500.00	\$6,000.00	\$6,000.00	\$5,200.00	\$5,000.00	\$3,144.18	\$4,250.26
DISBURSEMENTS							
Salaries	\$2,614.14	\$1,178.28	\$ 200.00	\$1,223.75	\$2,780.93	\$2,223.04	\$1,550.00
Labor	2,663.50	696.89	1,162.42	998.51	531.93	33.27	573.49
Publications	428.08	370.14	231.95	30.88	45.00	10.22	
Postage and Stationery	9.99	10.01	.90	31.05	25.51	3.20	11.21
Telephone and Telegraph	22.81		33.85	2.55	24.60		42.15
Freight and Express	4.00	127.35	41.75	34.69	50.16	91.94	45.65
Heat, Light, Water and Power	50.60		88.29	17.28	24.77	8.65	51.99
Sundry Supplies	176.31	82.35	212.77	150.30	198.54	308.28	177.68
Fertilizer		3.00			193.44	8.21	
Feeding Stuffs	118.15	35.20		508.00	184.30	577.70	
Library					5.87		
Tools, Machinery	73.85	87.21	378.21	428.54	222.17	159.47	793.86
Furniture and Fixtures	26.80		18.00		3.50	10.50	31.08
Scientific Apparatus					7.50		23.52
Livestock	1,111.15			260.04		129.25	
Traveling Expenses	90.49	66.65	59.76	260.03	211.65	69.53	579.71
Building and Repairs	110.13	340.58	67.93	47.59	390.13	9.65	180.00
Contingent Expenses						9.36	
Chemical and Lab. Sup.							95.85
Total	\$7,500.00	\$2,997.66	\$2,495.83	\$3,993.21	\$5,000.00	\$3,652.27	\$4,156.19
Balance Dec. 31, 1915		\$ 2.34	\$ 4.17	\$ 6.79		\$ 207.79	\$ 94.07

\*Federal funds are disbursed direct by the Government towards salaries of Superintendents or assistants; therefore, the disbursements here given are from State and County funds only.

## Branch Stations.

January 1, 1916 to June 30, 1916.

	Eastern Oregon	Umatilla Co.	Moro Co.	Harney Co.	Sou. Oregon	Clatsop Co.	Hood Riv. Co.
Balance Jan. 1, 1916						\$ 207.79	\$ 94.07
Appropriations—							
State	\$7,500.00	\$3,000.00	\$2,500.00	\$4,000.00	\$5,000.00	\$2,250.00	\$2,250.00**
Federal*		3,000.00	3,500.00	1,200.00			
County							1,000.00
Total	\$7,500.00	\$6,000.00	\$6,000.00	\$5,200.00	\$5,000.00	\$2,042.21	\$3,344.07
DISBURSEMENTS							
Salaries	\$1,633.30	\$1,249.97	\$ 500.00	\$ 843.30	\$1,613.30	\$ 766.65	\$2,025.36
Labor	958.75		370.12	467.21	213.40	180.95	53.03
Publications						7.30	176.44
Postage and Stationery	13.42			6.10	16.85	1.30	46.79
Telephone & Telegraph	13.70		1.00		6.30		22.16
Freight and Express					26.63	75.23	20.23
Heat, Light, Power	33.84				41.72	155.10	34.82
Chem. Lab. Sup.					24.60		5.85
Sundry Supplies	64.39	2.00		14.54	115.56	227.17	90.19
Fertilizer					5.65		
Feed Stuffs	36.00						
Library					3.94		1.83
Tools and Machinery	197.10	20.21			65.50	41.30	97.90
Furniture and Fixtures						13.75	15.00
Traveling Expenses	5.55	9.82		2.05	35.90	28.85	172.39
Contingent Expenses						3.75	
Buildings and Repairs	227.38				268.63	19.18	120.00
Total	\$3,183.43	\$1,282.00	\$ 871.12	\$1,333.20	\$2,437.98	\$1,520.53	\$2,881.99
Balance June 30, '16	\$1,316.57	\$1,718.00	\$1,628.88	\$2,666.80	\$2,562.02	\$ 521.68	\$ 462.08

\*Federal funds are disbursed direct by the Government towards salaries of Superintendents or assistants; therefore, the disbursements here given are from State and County funds only.

\*\*\$750.00 advanced by Auditor from Business Office, awaiting State Warrant.

Black face figures denote overdraft.

## Branch Stations.

January 1, 1916 to June 30, 1916.

	Eastern Oregon	Umatilla Co.	Moro Co.	Harney Co.	Sou. Oregon	Clatsop Co.	Hood Riv. Co.
Balance Jan. 1, 1916						\$ 207.79	\$ 94.07
Appropriations							
State .....	\$7,500.00	\$3,000.00	\$2,500.00	\$4,000.00	\$5,000.00	\$2,250.00	\$2,250.00**
Federal* .....		3,000.00	3,500.00	1,200.00			
County .....							1,000.00
Total .....	\$7,500.00	\$6,000.00	\$6,000.00	\$5,200.00	\$5,000.00	\$2,042.21	\$3,344.07
DISBURSEMENTS							
Salaries .....	\$1,633.30	\$1,249.97	\$ 500.00	\$ 843.30	\$1,613.30	\$ 766.65	\$2,025.36
Labor .....	958.75		370.12	467.21	213.40	180.95	53.03
Publications .....				6.10	16.85	7.30	176.44
Postage and Stationery .....	13.42				16.85	1.30	46.79
Telephone & Telegraph .....	13.70		1.00		6.30		22.16
Freight and Express .....					26.63	75.23	20.23
Heat, Light, Power .....	33.84				41.72	155.10	34.82
Chem. Lab. Sup. ....					24.60		5.85
Sundry Supplies .....	64.39	2.00		14.54	115.56	227.17	90.19
Fertilizer .....					5.65		
Feed Stuffs .....	36.00						
Library .....					3.94		1.83
Tools and Machinery .....	197.10	20.21			65.50	41.30	97.90
Furniture and Fixtures .....						13.75	15.00
Traveling Expenses .....	5.55	9.82		2.05	35.90	28.85	172.39
Contingent Expenses .....						3.75	
Building and Repairs .....	227.38				268.63	19.18	120.00
Total .....	\$3,183.43	\$1,282.00	\$ 871.12	\$1,333.20	\$2,437.98	\$1,520.53	\$2,881.99
Balance June 30, '16.	\$4,316.57	\$1,718.00	\$1,628.88	\$2,666.80	\$2,562.02	\$ 521.68	\$ 462.08

\*Federal funds are disbursed direct by the Government towards salaries of Superintendents or assistants; therefore, the disbursements here given are from State and County only.

\*\*\$750.00 advanced by Auditor from Business Office, awaiting State Warrant.  
Black face figures denote overdraft.

## Branch Stations.

October 1, 1914 to June 30, 1916.

	Eastern Oregon	Umatilla Co.	Sherman Co.	Harney Co.	Sou. Oregon	Clatsop Co.	Hood Riv. Co.
RECEIPTS*							
Balance Oct. 1, 1914....	\$ 7,005.40	\$20.44	\$ 125.20	\$.....	\$.....	\$.....	\$.....
Sales, etc. ....	22,776.53		1,189.57	1,758.75	157.72	1,893.14	100.00
Total Receipts .....	\$29,781.93	\$20.44	\$1,314.77	\$1,758.75	\$157.72	\$1,893.14	\$100.00
DISBURSEMENTS							
Salaries .....	\$ 632.66			\$ 451.25			
Labor .....	1,119.50		\$ 129.12	39.88	3.50	\$1,312.58	\$100.00
Publications .....	37.50			10.05			
Postage and Stationery .....	18.77		.75	33.20	5.00		
Telephone & Telegraph .....	25.26		18.29	112.35	5.00		
Freight and Express .....	40.52		18.42	246.50	70.81		
Heat, Light, Water and Power .....	37.50		86.93	75.77	16.87		
Sundry Supplies .....	346.27		90.97	522.85	18.46		
Fertilizer .....					18.00		
Feed Stuffs .....	768.18				4.00	580.56	
Tools and Machinery .....	66.93		134.50	38.94	16.00		
Furniture and Fixtures .....			5.71				
Livestock .....	9,631.55		60.00	45.00			
Traveling Expenses .....	164.85		17.45	103.35			
Building and Repairs .....	278.78		172.20	34.06			
Total .....	\$13,168.32	\$.....	\$ 734.34	\$1,713.20	\$157.64	\$1,893.14	\$100.00
Balance June 30, 1916.	\$16,613.61	\$20.44	\$ 580.43	\$ 45.55	\$ .08		

\*These receipts are derived from the sale of grain, etc., produced on the various experimental plots of the stations.



**Fertilizer Inspection.**

January 1, 1915 to June 30, 1916.

**RECEIPTS**

Fee for Fertilizer Inspection Service .....	\$979.54*
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**DISBURSEMENTS**

Salaries .....	\$200.00
Labor .....	121.05
Publications .....	3.12
Postage and Stationery .....	28.75
Telephone and Telegraph .....	11.53
Freight and Express .....	62.54
Chemical and Laboratory Supplies .....	80.08
Sundry Supplies .....	171.50
Furniture, Fixtures .....	47.33
Traveling Expenses .....	87.67
Buildings and Repairs .....	60.42

Total Disbursements .....	\$873.99
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Balance, June 30, 1916.....	\$105.55
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***DIVISION III—EXTENSION SERVICE.*****State General Education Extension Fund.**

October 1, 1914 to December 31, 1914.

**RECEIPTS**

State Appropriation, 1914 (Balance) .....	\$11,749.96
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**DISBURSEMENTS**

Salaries .....	\$5,033.87
Labor .....	375.38
Publications .....	2,059.84
Postage and Stationery .....	469.23
Telephone and Telegraph .....	183.04
Freight and Express .....	246.18
Sundry Supplies .....	402.20
Tools, Machinery .....	380.17
Furniture and Fixtures .....	445.96
Scientific Apparatus .....	1.22
Traveling Expense .....	1,983.73

Total Disbursements .....	\$11,580.82
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Balance December 31, 1914.....	\$ 169.14
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**State General Education Extension Fund.**

January 1, 1915 to December 31, 1915.

**RECEIPTS**

State Appropriation, 1915 .....	\$25,000.00
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**DISBURSEMENTS**

Salaries .....	\$19,561.36
Labor .....	1,193.51
Publications .....	613.51
Postage and Stationery .....	394.17
Telephone and Telegraph .....	210.51
Freight and Express .....	242.93
Sundry Supplies .....	522.20
Feeding Stuffs .....	26.20
Library .....	1.35
Tools, Machinery .....	151.35
Furniture and Fixtures .....	351.36
Scientific Apparatus .....	144.30
Traveling Expense .....	1,574.39

Total Disbursements .....	\$24,987.14
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Balance June 30, 1916 .....	\$ 12.86
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\*Derived through fees charged for testing the various brands of commercial fertilizers put on the market in the State of Oregon. Chapter 10, Session Laws of 1905.

## OREGON AGRICULTURAL COLLEGE

## State General Education Extension Fund.

January 1, 1916 to June 30, 1916.

## RECEIPTS

State Appropriation, 1916 .....	\$25,000.00
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## DISBURSEMENTS

Salaries .....	\$6,688.32	
Labor .....	603.21	
Publications .....	85.63	
Postage and Stationery .....	36.00	
Telephone and Telegraph .....	45.91	
Freight and Express .....	126.02	
Sundry Supplies .....	78.67	
Feeding Stuffs .....	4.55	
Tools, Machinery .....	56.90	
Traveling Expenses .....	684.95	
Total Disbursements .....		\$ 8,410.16
Balance June 30, 1916 .....		\$16,589.84

## Agricultural Institute\*.

October 1, 1914 to December 31, 1915.

## RECEIPTS

	1914	1915
State Appropriation .....	\$1,167.94	\$2,500.00

## DISBURSEMENTS

Salaries .....	\$ 300.00	\$1,033.34
Labor .....	1.45	53.35
Postage and Stationery .....	.10	7.10
Telephone and Telegraph .....	4.63	1.02
Freight and Express .....	6.90	3.71
Sundry Supplies .....	7.43	101.71
Library .....	....	20.75
Travelin~ Expense .....	847.43	1,279.02
Total Disbursements .....	\$1,167.94	\$2,500.00

\*Law repealed by Legislature, 1915.

## Federal Smith-Lever Fund\*

July 1, 1914 to June 30, 1915.

## RECEIPTS

Federal Appropriation .....	\$10,000.00
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## DISBURSEMENTS

Salaries .....	\$6,799.14	
Labor .....	293.72	
Publications .....	428.21	
Postage, Telephone, Freight and Express .....	45.87	
Stationery and Small Printing .....	77.05	
Supplies .....	151.19	
Tools, Appliances, Machinery .....	38.41	
Scientific Apparatus .....	7.65	
Traveling Expense .....	2,158.76	
Total Disbursements .....		\$10,000.00
Balance June 30, 1915 .....		.....

\*Receipts from Federal Government under Smith-Lever Act in excess of \$10,000 are duplicated by the State. For the year ending June 30, 1916, therefore, \$4,446.36 of the Federal fund is duplicated by the State. The State share is part of the \$25,000 appropriation reported on preceding page.

# REPORT OF THE TREASURER

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## Federal Smith-Lever Fund\*

July 1, 1915 to June 30, 1916.

### RECEIPTS

Federal Appropriation .....	\$14,446.36
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### DISBURSEMENTS

Salaries .....	\$8,765.95
Labor .....	188.50
Publications .....	849.06
Postage, Tel. and Tel., Freight and Express.....	36.79
Stationery and Small Printing .....	10.70
Supplies .....	94.20
Tools, Machinery and Appliances .....	16.67
Traveling .....	4,484.49

Total Disbursements .....	\$14,446.36
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Balance June 30, 1916 .....	.....
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## Extension Miscellaneous Fund.

July 1, 1914 to June 30, 1916.

### RECEIPTS

Balance July 1, 1914 .....	\$106.56
Miscellaneous Sales, etc. ....	852.14

Total Receipts .....	\$958.70
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### DISBURSEMENTS

Salaries .....	\$ 29.33
Labor .....	71.29
Publications .....	95.00
Telephone and Telegraph .....	.55
Freight and Express .....	9.04
Sundry Supplies .....	168.43
Traveling Expenses .....	298.38
Contingent Expense .....	25.79

Total Disbursements .....	\$697.81
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Balance June 30, 1916 .....	\$260.89
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## Cooperative Dairy Demonstration.

October 1, 1914 to June 30, 1916.

### RECEIPTS

Balance October 1, 1914 .....	\$2,989.01
State Appropriation, 1915-16 .....	2,700.00

Total .....	\$5,689.01
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### DISBURSEMENTS

Salaries .....	\$1,158.99
Labor .....	85.13
Publications .....	183.41
Postage, Stationery, Telephone and Telegraph.....	89.95
Freight and Express .....	42.42
Heat, Light, Power, Water .....	11.35
Chemical and Laboratory Supplies .....	1.86
Seeds, Sundry Supplies .....	86.26
Tools, Machinery .....	693.10
Furniture, Fixtures .....	117.85
Traveling Expenses .....	2,601.21
Building and Repairs .....	75.00

Total .....	\$5,146.53
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Balance June 30, 1916 .....	\$ 542.48
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\*See note p. 148.



**Cooperative Farm Management.**

July 1, 1915 to June 30, 1916.

**RECEIPTS**

State Appropriation, 1915-16 .....	\$1,326.00
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**DISBURSEMENTS**

Salaries .....	\$368.06
Labor .....	29.93
Publications .....	4.01
Postage and Stationery, Telephone and Telegraph.....	1.10
Seeds, Sundry Supplies .....	18.10
Traveling Expenses .....	736.69
<b>Total .....</b>	<b>\$1,157.89</b>
<b>Balance June 30, 1916 .....</b>	<b>\$ 168.11</b>

**Organization and Marketing.**

March 15, 1915 to June 30, 1916.

**RECEIPTS**

State Appropriations, 1915-16 .....	\$2,835.00
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**DISBURSEMENTS**

Salaries .....	\$826.50
Labor .....	192.41
Postage, Stationery, Telephone and Telegraph.....	9.35
Seeds, Sundry Supplies .....	7.72
Furniture, Fixtures .....	5.92
Traveling Expenses .....	690.14
<b>Total .....</b>	<b>\$1,732.04</b>
<b>Balance June 30, 1916 .....</b>	<b>\$1,102.96</b>

**Industrial Club Work.**

Receipts and Disbursements to June 30, 1916.

**RECEIPTS**

Balance December 10, 1914 .....	\$1,989.03
State Appropriation, 1915-16 .....	3,000.00
<b>Total .....</b>	<b>\$4,989.03</b>

**DISBURSEMENTS**

Salaries .....	\$1,688.34
Labor .....	589.53
Publications .....	381.59
Postage, Stationery, Telephone and Telegraph.....	209.82
Freight and Express .....	37.60
Seeds and Supplies .....	256.12
Tools and Machinery .....	167.14
Furniture and Fixtures .....	158.19
Scientific Apparatus .....	57.40
Traveling Expenses .....	1,373.14
<b>Total .....</b>	<b>\$4,318.87</b>
<b>Balance June 30, 1916 .....</b>	<b>\$ 670.16</b>

# REPORT OF THE TREASURER

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## Cooperative County Agriculturist Work.

October 1, 1914 to June 30, 1916.

### RECEIPTS

Balance October 1, 1914 .....	\$3,138.64
State Appropriation, 1915-16 .....	4,649.00

Total .....	\$7,787.64
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### DISBURSEMENTS

Salaries .....	\$3,090.66
Labor .....	225.15
Publications .....	17.11
Postage, Stationery, Telephone and Telegraph .....	250.50
Freight and Express .....	27.10
Chemical and Laboratory Supplies .....	9.86
Seeds, Sundry Supplies .....	235.40
Tools, Machinery .....	185.93
Furniture, Fixtures .....	197.66
Traveling Expenses .....	1,891.42

Total .....	\$6,130.79
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Balance June 30, 1916 .....	\$1,656.85
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## Pig Club Work.

November 30, 1915 to June 30, 1916.

### RECEIPTS

State Appropriation, 1915-16 .....	\$1,200.00
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### DISBURSEMENTS

Salaries .....	\$ 75.00
Labor .....	106.66
Postage, Stationery, Telephone and Telegraph .....	11.23
Freight and Express .....	7.79
Sundry Supplies .....	6.05
Tools, Machinery .....	14.40
Furniture, Fixtures .....	70.00
Scientific Apparatus .....	17.90
Traveling Expenses .....	570.01
Contingent Expenses .....	15.00

Total .....	\$ 894.04
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Balance June 30, 1916 .....	\$ 305.96
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## Coos County Agriculturist.

December 10, 1914 to June 30, 1916.

### RECEIPTS

	State	County
Balance December 10, 1914 .....	\$ 763.90	\$1,000.00
Appropriation, 1915-16 .....	2,000.00	2,000.00
Total .....	\$2,763.90	\$3,000.00

### DISBURSEMENTS

Salaries .....	\$ 965.98	\$2,474.77
Labor .....	92.85	.....
Publications .....	.....	.....
Postage and Stationery .....	15.44	5.35
Telephone and Telegraph .....	92.93	.....
Freight and Express .....	22.85	.....
Heat, Light, Power and Water .....	23.95	.....
Seeds, Sundry Supplies .....	29.35	26.04
Tools Machinery .....	61.12	.....
Furniture and Fixtures .....	22.85	3.68
Traveling Expenses .....	578.67	.....
Contingent Expenses .....	172.50	.....

Total .....	\$2,078.49	\$2,509.84
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Balance June 30, 1916 .....	\$ 685.41	\$ 490.16
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## OREGON AGRICULTURAL COLLEGE

## Crook County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914 .....	\$1,070.60	\$ 357.00
Appropriation, 1915-1916 .....	2,800.00	2,050.00
Sales .....		37.00
Total .....	\$3,870.60	\$2,444.00

## DISBURSEMENTS

Salaries .....	\$1,133.33	\$2,041.67
Labor .....	175.60	26.75
Postage and Stationery .....	257.27	10.13
Telephone and Telegraph .....	32.30	6.85
Freight and Express .....	14.07	4.20
Heat, Light, Power and Water .....	20.25	2.50
Seeds, Sundry Supplies .....	64.25	110.19
Tools, Machinery .....	710.70	29.59
Furniture, Fixtures .....	11.99	.....
Traveling Expenses .....	474.91	40.45
Contingent Expenses .....	72.00	6.00

Total .....	\$2,966.67	\$2,278.33
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Balance June 30, 1916 .....	\$ 903.93	\$ 165.67
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\*\$750.00 to follow.

## Harney County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914 .....	\$ 6.40	\$ 802.82
Appropriation for 1915 .....	1,000.00	1,000.00
Sales .....		194.95
Total .....	\$1,006.40	\$1,997.77

## DISBURSEMENTS

Salaries .....	\$ 125.00	\$1,103.12
Labor .....	585.00	.....
Publications .....	.....	2.25
Postage and Stationery .....	9.95	11.86
Telephone and Telegraph .....	6.50	.....
Freight and Express .....	.....	12.28
Sundry Supplies .....	81.90	189.39
Tools, Machinery .....	79.70	255.85
Furniture and Fixtures .....	15.65	78.67
Traveling Expenses .....	100.60	314.35
Contingent Expenses .....	.....	30.00

Total .....	\$1,004.30	\$1,997.77
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Balance June 30, 1916 .....	\$ 2.10	.....
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NOTE:—Appropriation discontinued.

## Jackson County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914.....	\$ 230.29	\$1,117.48
Appropriation 1915-16 .....	4,000.00	3,000.00*
Sales .....	.....	37.17
Total .....	\$4,230.29	\$4,154.65

\* \$1,000.00 to follow.



# REPORT OF THE TREASURER

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## DISBURSEMENTS

Salaries .....	\$1,786.23	\$2,956.64
Labor .....	14.00	.....
Postage and Stationery.....	40.24	42.66
Telephone and Telegraph.....	55.75	10.05
Freight and Express .....	22.33	2.79
Heat, Light, Power, Water.....	13.60	2.00
Chemical and Laboratory Supplies.....	17.45	412.71
Seeds, Sundry Supplies .....	22.20	33.47
Tools, Machinery .....	189.99	206.43
Furniture, Fixtures .....	121.15	3.82
Scientific Apparatus .....	86.95	.....
Traveling Expenses .....	377.30	152.81
Contingent Expenses .....	310.00	80.00
Total .....	\$3,057.19	\$3,903.38
Balance June 30, 1916.....	1,173.10	251.27

## Josephine County Agriculturist.

March 20, 1916 to June 30, 1916.

## RECEIPTS

	State	County
Appropriation 1916 .....	\$1,350.00	\$ 675.00*

## DISBURSEMENTS

Salaries .....	\$ 314.65	\$ 125.00
Postage and Stationery .....	14.55	.....
Telephone and Telegraph .....	.50	.....
Freight and Express .....	8.98	.....
Sundry Supplies .....	9.34	1.13
Tools, Machinery .....	409.16	37.00
Furniture, Fixtures .....	122.32	4.10
Traveling Expenses .....	64.86	.....
Contingent Expenses .....	20.00	.....
Total .....	\$ 964.36	\$ 167.23
Balance June 30, 1916.....	385.64	507.77

\*\$675.00 to follow.

## Klamath County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914.....	\$1,016.55	\$ 52.00
Appropriation 1915-16 .....	3,500.00	3,250.00*
Sales .....	.....	74.65
Total .....	\$4,516.55	\$3,376.65

## DISBURSEMENTS

Salaries .....	\$ 816.65	\$2,032.10
Labor .....	86.00	4.00
Postage and Stationery .....	45.81	13.20
Telephone, Telegraph .....	33.12	5.55
Freight and Express.....	17.69	5.08
Heat, Light, Power, Water.....	34.45	2.70
Sundry Supplies .....	218.77	96.64
Library .....	.85	.....
Tools, Machinery .....	1,164.85	430.59
Furniture, Fixtures .....	76.90	70.42
Scientific Apparatus .....	5.00	.....
Traveling Expenses .....	487.53	81.30
Contingent Expenses .....	101.70	50.00
Total .....	\$3,089.32	\$2,791.58
Balance June 30, 1916.....	1,427.23	585.07

\*\$750.00 to follow.

## OREGON AGRICULTURAL COLLEGE

## Lake County Agriculturist.

January 18, 1915 to June 30, 1916.

## RECEIPTS

	State	County
Appropriation, 1915-16 .....	\$3,000.00	\$1,875.00*

## DISBURSEMENTS

Salaries .....	\$ 750.00	\$1,333.32
Postage and Stationery .....	23.97	4.90
Telephone and Telegraph .....	3.15	.....
Freight and Express .....	.66	.....
Sundry Supplies .....	117.53	15.45
Tools, Machinery .....	866.01	245.12
Furniture, Fixtures .....	50.00	3.89
Traveling Expense .....	650.06	105.20
Total .....	\$2,461.38	\$1,707.88
Balance, June 30, 1916.....	538.62	167.12

\* \$1,125.00 to follow.

## Lane County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914.....	\$ 600.48	\$ 259.85
Appropriation 1915-16 .....	3,000.00	2,750.00*
Total .....	\$3,600.48	\$3,009.85

## DISBURSEMENTS

Salaries .....	\$1,259.67	\$2,030.16
Labor .....	81.95	31.95
Postage and Stationery .....	81.16	19.16
Telephone, Telegraph .....	75.03	14.15
Freight and Express .....	12.53	.....
Heat, Light, Power, Water.....	12.30	4.75
Sundry Supplies .....	46.83	8.60
Tools, Machinery .....	547.52	217.48
Furniture, Fixtures .....	71.60	49.23
Traveling Expenses .....	438.37	105.41
Contingent Expenses .....	237.75	15.00
Total .....	\$2,864.71	\$2,495.89
Balance June 30, 1916.....	735.77	513.96

\* \$750.00 to follow.

## Malheur County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914.....	\$2,320.35	\$ 375.00
Appropriation for 1916.....	800.00	1,925.00*
Total .....	\$3,120.35	\$2,300.00

## DISBURSEMENTS

Salaries .....	\$ 433.32	\$1,516.13
Labor .....	18.35	436.29
Postage and Stationery.....	7.35	5.16
Telephone, Telegraph .....	1.87	.....
Freight and Express .....	18.78	.....
Sundry Supplies .....	18.85	10.03
Tools, Machinery .....	1,029.10	.....
Furniture, Fixtures .....	55.05	24.93
Traveling Expenses .....	710.20	.....
Total .....	\$2,292.87	\$1,992.54
Balance June 30, 1916.....	827.48	307.46

\* \$750.00 to follow.

# REPORT OF THE TREASURER

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## Marion County Agriculturist.

December 10, 1914 to June 30, 1916.

### RECEIPTS

	State	County
Balance .....		\$ 65.23
Appropriation 1914-15-16 .....	\$2,360.25	900.00*
Total .....	\$2,360.25	\$ 965.23

### DISBURSEMENTS

Salaries .....	\$1,507.87	\$ 545.35
Labor .....	81.45	45.00
Postage and Stationery .....	35.52	16.51
Telephone, Telegraph .....	39.24	16.50
Freight and Express .....	5.35	1.35
Sundry Supplies .....	52.34	14.29
Tools, Machinery .....	242.61	105.25
Furniture, Fixtures .....		13.75
Traveling Expenses .....	387.67	207.23
Contingent Expense .....	5.00	
Total .....	\$2,357.05	\$ 965.23
Balance, June 30, 1916.....	3.20	

\*Balance paid Fruit Inspector direct by County.

## Multnomah County Agriculturist.

January 28, 1916 to June 30, 1916.

### RECEIPTS

	State	County
Appropriation 1916 .....	\$1,600.00	\$ 800.00*

### DISBURSEMENTS

Salaries .....	\$ 372.58	\$ 450.00
Postage and Stationery .....	16.80	
Telephone, Telegraph .....	1.50	
Freight and Express .....	1.88	
Sundry Supplies .....	8.04	
Tools, Machinery .....	460.53	
Furniture, Fixtures .....	167.65	2.35
Traveling Expenses .....	42.91	
Contingent Expenses .....	24.00	
Total .....	\$1,095.89	\$ 452.35
Balance June 30, 1916.....	504.11	347.65

\*\$800.00 to follow.

## Tillamook County Agriculturist.

December 10, 1914 to June 30, 1916.

### RECEIPTS

	State	County
Balance December 10, 1914.....	\$1,320.99	\$ 522.86
Appropriation 1915-16 .....	3,000.00	2,375.00*
Total receipts .....	\$4,320.99	\$2,897.86

### DISBURSEMENTS

Salaries .....	\$ 150.00	\$2,856.69
Labor .....	1.50	
Publications .....	13.50	
Postage and Stationery .....	105.24	9.20
Telephone, Telegraph .....	109.60	
Freight and Express .....	10.70	
Sundry Supplies .....	60.53	10.88
Tools, Machinery .....	350.80	6.35
Furniture, Fixtures .....	96.07	4.03
Traveling Expenses .....	836.00	
Contingent Expenses .....	8.00	
Total .....	\$1,741.94	\$2,887.15
Balance June 30, 1916.....	2,579.05	10.71

\*\$1,125.00 to follow.



## OREGON AGRICULTURAL COLLEGE

## Union County Agriculturist.

December 10, 1914 to June 30, 1916.

## RECEIPTS

	State	County
Balance December 10, 1914.....	\$ 1.47	\$ 36.11
Appropriation for 1915-1916 .....	3,400.00	2,850.00
Total Receipts .....	\$3,401.47	\$2,886.11

## DISBURSEMENTS

Salaries .....	\$1,213.32	\$1,326.34
Labor .....	173.77	328.50
Publications .....	2.00	.....
Postage and Stationery .....	72.32	11.30
Telephone and Telegraph .....	46.51	15.80
Freight and Express .....	20.06	11.39
Sundry Supplies .....	65.36	46.59
Library .....	.....	1.15
Tools, Machinery .....	222.71	452.40
Furniture, Fixtures .....	.....	4.32
Scientific Apparatus .....	.....	25.70
Traveling Expenses .....	306.26	293.75
Total .....	\$2,122.31	\$2,517.24
Balance June 30, 1916.....	1,279.16	368.89

\*\$850.00 to follow.

## Wasco County Agriculturist.

January 5, 1916 to June 30, 1916.

## RECEIPTS

	State	County
Appropriation 1916 .....	\$1,800.00	\$ 900.00

## DISBURSEMENTS

Salaries .....	\$ 282.26	\$ 304.25
Labor .....	9.00	.....
Postage and Stationery .....	35.94	.....
Telephone, Telegraph .....	7.90	.....
Freight and Express .....	19.49	.....
Heat, Light, Power, Water.....	35	.....
Sundry Supplies .....	16.90	7.50
Tools, Machinery .....	444.60	6.14
Furniture, Fixtures .....	42.75	3.33
Traveling Expenses .....	117.38	.....
Total .....	\$ 976.57	\$ 321.22
Balance June 30, 1916 .....	823.43	578.78

\*\$900.00 to follow.

## Yamhill County Agriculturist.

January 31, 1916 to June 30, 1916.

## RECEIPTS

	State	County
Appropriation, 1916 .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salaries .....	\$ 333.32	\$ 450.49
Labor .....	2.00	.....
Postage and Stationery.....	28.05	1.74
Telephone, Telegraph .....	13.95	.....
Freight and Express .....	5.26	.....
Sundry Supplies .....	6.25	.....
Tools, Machinery .....	84.45	5.84
Furniture, Fixtures .....	161.16	3.26
Traveling Expenses .....	130.38	.....
Total .....	\$ 764.82	\$ 461.33
Balance June 30, 1916.....	735.18	288.67

\*\$750.00 to follow.

**Wheeler County Agriculturist.**  
**June 22, 1915 to June 30, 1916.**

**RECEIPTS**

	State	County
Appropriation 1915-16 .....	\$1,650.00	\$1,000.00*
<b>DISBURSEMENTS</b>		
Salaries .....	\$ 465.35	\$ 289.02
Labor .....	.75	.....
Postage and Stationery .....	5.52	5.35
Telephone, Telegraph .....	.47	1.80
Freight and Express .....	9.36	2.19
Heat, Light, Power, Water.....	.80	.....
Sundry Supplies .....	15.65	12.50
Tools, Machinery .....	450.31	193.15
Furniture, Fixtures .....	68.84	4.46
Traveling Expenses .....	164.70	60.35
<b>Total .....</b>	<b>\$1,181.75</b>	<b>\$ 568.82</b>
Balance June 30, 1916.....	468.25	431.18

***DIVISION IV—MISCELLANEOUS DEPARTMENTS.*****Pure Seed Fund.**

**October 1, 1914 to June 30, 1916.**

**RECEIPTS**

Balance October 1, 1914.....	\$ 17.60
Appropriation, State .....	890.11
Sales .....	16.25
<b>Total .....</b>	<b>\$ 923.96</b>

**DISBURSEMENTS**

Salaries .....	\$ 651.72
Labor .....	52.13
Publications .....	69.69
Postage and Stationery .....	54.60
Chemical and Laboratory Supplies.....	1.76
Seeds, Sundry Supplies .....	55.57
Traveling Expenses .....	8.55
<b>Total .....</b>	<b>\$ 894.02</b>
Balance June 30, 1916.....	29.94

**Extermination of Rabbits.**

**July 1, 1915 to June 30, 1916.**

County	Appropriation	Expended	Balance June 30, 1916
Crook —State .....	\$ 250.00	\$ 250.00	.....
—County .....	250.00	250.00	.....
Malheur —State .....	250.00	182.00	\$ 68.00
—County .....	250.00	249.90	.10
Morrow —State .....	250.00	250.00	.....
—County .....	250.00	250.00	.....
Umatilla—State .....	250.00	250.00	.....
—County .....	250.00	250.00	.....
<b>Total .....</b>	<b>\$2,000.00</b>	<b>\$1,931.90</b>	<b>\$ 68.10</b>

**Standard Babcock Glassware Testing.**

**June 1, 1915 to June 30, 1916.**

**RECEIPTS**

Testing glassware .....	\$ 316.93
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**DISBURSEMENTS**

Refunds .....	\$ 2.48
Labor .....	188.59
Supplies .....	17.75
Stationery and Printing .....	42.70
Freight and Express .....	32.87
Traveling Expense.....	5.25
Repairs .....	2.50
Equipment .....	15.00
<b>Total disbursements .....</b>	<b>307.14</b>
Balance June 30, 1916.....	\$ 9.79

\*\$650.00 to follow.

## Dormitories.

July 1, 1914, to June 30, 1915.

## RECEIPTS

Balance July 1, 1914	
Table Board, etc	\$1,345.44
Room Deposits	601.07

## Receipts

Table Board and Room Deposits	41,809.58
-------------------------------	-----------

\$1,946.51

Total Balance and Receipts

\$43,756.00

## DISBURSEMENTS

Food	\$19,091.85
Supplies	555.17
Salaries and Labor	11,399.32
Light and Power	781.33
Water	376.56
Freight and Express	298.56
Laundry	589.67
Postage and Stationery	38.15
Telephone and Telegraph	64.04
Flowers, Plants and Decorations	164.00
Equipment	1,214.35
Improvement and Repairs	704.85
Refunds—Room Deposits and Board	520.25

Total expenditures	{ Waldo \$24,820.78
	{ Cauthorn 10,977.32

\$35,798.10

Balance, July 1, 1915	{ General Fund \$ 7,391.17
	{ Room Deposits 566.82

\$ 7,957.99

## Dormitories.

July 1, 1915 to June 30, 1916.

## RECEIPTS

Balance, July 1, 1915	
Table Board, etc	\$ 7,391.17
Room Deposits	566.82
Receipts	
Table Board, etc	\$36,862.72
Room Deposits	528.00

37,390.72

Total balance and receipts \$45,348.71

## DISBURSEMENTS

Food	\$19,392.26
Supplies	1,053.20
Salaries and Labor—	
General	\$11,280.78
Improvements and Repairs	767.08

\$12,047.86

Light and Power 679.78

Heating, 1914-15 \$ 2,752.90

Heating, 1915-16 2,527.00

5,279.90

Water 333.54

Freight and Express

Food Supplies 233.88

Equipment 30.77

Improvements and Repairs 76.73

341.38

Laundry 667.90

Printing and Office Supplies 24.55

Telephone 65.88

Improvement and Repairs 1,953.42

Equipment 1,252.93

Refunds—Room and Board 19.00

Room Deposits 474.30

Total expenditures	{ Waldo \$30,918.36
	{ Cauthorn 12,667.54

43,585.90

Balance July 1, 1916

\$ 1,762.81

\*Heating—Voucher for Heating department not received in time for entry in June business, amounting to \$2,752.90, which will reduce the available general balance to \$4,638.27.

**Creamery.**

July 1, 1914 to June 30, 1915.

**RECEIPTS**

Balance July 1, 1914.....	\$ 221.96
Receipts during year .....	16,083.67
Total Balance and Receipts.....	

\$16,305.63

**DISBURSEMENTS**

Labor .....	\$ 194.40
Supplies—Butterfat, etc .....	15,956.86
Freight and Express.....	296.85
Drayage .....	413.00
Miscellaneous .....	1.37
Telephone and Telegraph.....	1.80

Total Disbursements .....

\$16,864.28

Balance—Overdraft July 1, 1915.....

\$ 558.65

**Creamery.**

July 1, 1915 to June 30, 1916.

**RECEIPTS**

Sales of butter, cream, cheese, etc.....	\$19,096.98
--	-------------

**DISBURSEMENTS**

Overdraft of July 1, 1915; deficit of 1914-15.....	\$ 558.65
Labor .....	251.75
Butterfat, Cream, etc .....	18,031.94
Supplies—including Laundry .....	709.15
Freight and Express .....	334.04
Drayage .....	389.92
Telephone and Telegraph .....	14.13
Repairs .....	28.03
Miscellaneous .....	21.00

Total .....

\$20,338.61

Overdraft July 1, 1916.....

\* \$ 1,241.63

**Military Special.**

July 1, 1914 to June 30, 1915.

**RECEIPTS**

Balance, July 1, 1914.....	\$ 455.58
Sales of Uniforms and Accoutrements.....	3,979.28

Total .....

\$4,434.86

**DISBURSEMENTS**

Labor .....	\$ 78.33
Uniforms and Accoutrements .....	3,553.05
Freight and Express.....	117.20
Telephone and Telegraph .....	2.52
Office Supplies .....	30.75
Sundry Supplies .....	33.60
Inspection Expenses .....	119.45

Total Disbursements .....

\$3,934.90

Balance July 1, 1915.....

\$ 499.96

**Military Special.**

July 1, 1915 to June 30, 1916.

**RECEIPTS**

Balance July 1st, 1915.....	\$ 499.96
Sales of Uniforms and Accoutrements.....	5,295.29

Total .....

\$5,795.25

**DISBURSEMENTS**

Labor .....	\$ 59.07
Uniforms and Accoutrements .....	5,373.14
Freight and Express .....	49.51
Tel. and Tel. and Printing.....	5.05
Inspection Expenses .....	36.70

Total Disbursements .....

\$5,523.47

Balance July 1st, 1916.....

\$ 271.78

\*Stock on hand for sale will greatly reduce this deficit.



## OREGON AGRICULTURAL COLLEGE

## Student Loan Fund.

July 1, 1916.

Fund established January, 1911

Subscriptions, Donations, etc.....	\$5,511.28	
Interest Collected—On Contracts.....	\$ 422.82	
Daily Balance, Bank .....	94.71	517.53
		<hr/>
Total Receipts for Fund.....		\$6,028.81
Outstanding—Principal on Contracts—163, averaging \$35.83		\$5,840.35
		<hr/>
Balance, July 1st, 1916.....		\$ 188.46
Loans made during fiscal year 1915-16—119, averaging \$36.67		\$4,364.00
Loans made since organization—309, averaging \$37.01.....		11,437.00
Loan contracts overdue—38, averaging \$30.72.....		1,167.50
Subscriptions to Fund during fiscal year.....		1,424.65
Interest collected during fiscal year.....		198.16

## RECAPITULATION

Loans outstanding July 1st, 1915.....	104@ \$34.12	\$3,548.55
Loans made fiscal year 1915-16.....	119@ 36.67	4,364.00
		<hr/>
Total balance and issued.....	223@ \$35.48	\$7,912.55
Loans collected since July 1st, 1915.....	60@ 34.53	2,072.20
		<hr/>
Balance outstanding July 1, 1916.....	163@ \$ 35.83	\$5,840.35

## FINANCIAL STATEMENT

Balance on hand July 1st, 1915 .....	\$ 857.45
Donations during fiscal year 1915-16.....	1,424.65
Interest collections fiscal year 1915-16.....	198.16
Principal collections fiscal year 1915-16.....	2,072.20
	<hr/>
Total receipts .....	\$4,552.46
Loans made during fiscal year, as shown above.....	4,364.00
Balance on hand July 1st, 1916.....	188.46
	<hr/>

## ESTIMATES OF REQUIREMENTS.

Estimates of financial requirements for the years 1917 and 1918 for  
 1) additional instructors and assistants, (2) general and miscellaneous  
 maintenance, (3) repairs, (4) improvements, (5) equipment.

## I—Additional Instructors and Assistants.

Following is a list of the instructors and assistants for each of the  
 years 1917 and 1918, in addition to the present force for resident in-  
 struction:

## Agriculture—

	1917	1918 Biennium	
Irrigation and Drainage—Instructor .....	\$ 500*	\$ 1,400	\$ 1,900
Farm Crops—Instructor .....	500*	1,400	1,900
Horticulture—By-Products Instructor .....	600*	800	1,400
Animal Husbandry—Instructor-Secretary ....	1,000	1,000	2,000
Bacteriology—Fellow .....	...	500*	500

## Engineering—

Chemical Engineering—Professor .....	2,000	2,000	4,000
Experimental Engineering—Fellow .....	...	500	500

## Home Economics—

Domestic Art—Instructor .....	...	1,200	1,200
Domestic Science—Instructor .....	1,000	1,200	2,200
Domestic Science—Assistance .....	350	350*	700

## Forestry—

Logging Engineering—Instructor .....	500*	500*	1,000
Student Assistance in Laboratories .....	...	300	300

## Commerce—

Two Teaching Fellows at \$500 each.....	1,000	1,000	2,000
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## Pharmacy—

Assistance .....	300*	500*	800
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## Service Departments—

Art—Instructor Drawing** .....	585	780	1,365
Rural Architecture—Assistance .....	300*	500*	800
Chemistry—Instructor .....	1,200	1,400	2,600
Chemistry—Instructor .....	1,200	1,400	2,600
Chemistry—Laboratory Assistance .....	400	400*	800
English—Instructor .....	1,200	1,200	2,400
Mathematics—Instructor .....	500*	1,200	1,700
Modern Languages—Instructor .....	1,200	1,200	2,400
Library—Assistant .....	...	720	720
Agricultural Education—Professor .....	1,800	2,000	3,800
Clerical Assistance Throughout Institution....	1,050	1,050	2,100

\$17,185	\$24,500	\$41,685
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## II—General or Miscellaneous Maintenance.

Summary of requirements for general or miscellaneous maintenance.  
 The requirements for class, laboratory, and shop supplies are excluded,  
 as these items are completely covered by student, class, laboratory, and  
 shop fees.

\*Fellowship, or part-time instructor.

\*\*Amount required to provide full-time instructor in place of present  
 part-time assistant.

	1917	1918	Bienniu
Janitorial .....	\$13,000	\$13,500	\$ 26,500
Heating .....	20,000	20,300	40,300
Campus and Greenhouse .....	6,000	6,000	12,000
Light and Power .....	6,300	6,500	12,800
Traveling expenses .....	4,500	4,500	9,000
Office and general supplies .....	4,000	4,000	8,000
Publications .....	6,000	6,000	12,000
Advertising .....	3,500	3,500	7,000
Nightwatch salary and miscellaneous .....	1,000	1,000	2,000
Summer School .....	2,500	2,500	5,000
Water Tax .....	1,600	1,600	3,200
Winter Short Course .....	1,000	1,000	2,000
Telephone and Telegraph .....	1,200	1,200	2,400
Faculty Committees, Commencement and Convocation expenses, Premium on bonds, Insurance on Government military equipment, Rental Shepard Hall, etc.....	2,400	2,400	4,800
Emergency balance .....	1,000	1,000	2,000
	<hr/> \$74,000	<hr/> \$75,000	<hr/> \$149,000

### III—Repairs.

Below is a summary of the repairs to the buildings listed. The estimates cover the necessary repairs including interior and exterior painting, refinishing floors, repairing plastering, replacing window shades, refitting doors and windows, repairing down-spouts, roofs, roof gutter etc.:

	1917	1918	Bienniu
Administration Building .....	\$ 600		
Agricultural, Horticultural, and Agronomy Buildings .....	3,000		
Armory .....	1,730		
Dairy Barns .....	1,110		
Dairy Building .....	800		
Farm Mechanics Building .....	273		
Foundry and Cabinet Shop .....	445		
Home Economics .....	1,150		
Men's Gymnasium .....	1,175		
Mechanic Arts Building .....	800		
Mechanical Hall .....	1,200		
Mines Building .....	1,000		
Old Heating Plant .....	182		
Campus Residence .....	279		
Poultry and Incubator House .....	600		
Science Hall .....	2,500		
Stock Barn .....	700		
Stock Judging Pavilion.....	140		
Women's Gymnasium .....	1,000		
Class Monuments .....	300		
Health Service Building .....	250		
Forestry Building .....	500		
Practice House .....	530		
Octagon Barn and Sheds .....	300		
Hog Barn .....	60		
Total for biennium .....	<hr/> \$20,624		
Total per year .....		<hr/> \$10,312	<hr/> \$10,312 \$20,624

## IV—Improvements.

The following is a summary of the most urgently needed improvements for the biennial period 1917-1918:

## FIRE PROTECTION:

	1917	1918	Biennial
<b>Fire Escapes—</b>			
Science Hall .....	\$707		
Cauthorn Hall .....	551		
Waldo Hall .....	742		
	<hr/>		\$2,000

## Science Hall—

Changing gas machine, including pit, piping, etc. ....	642		
3 Shower baths at \$17.50 .....	\$52		
4 Woolen blankets at \$7.50 .....	30		
4 Bell Fire alarms .....	66		
Replacing glass in transoms and doors with wired glass .....	15	163	805

## General—

Piping and 50-ft. hose at Old Power House .....	\$ 39		
3 Pyrene Extinguishers .....	21		
Fire Alarm System for Agricultural Hall .....	173		
Fire Alarm System for Home Eco- nomics Building .....	50		
Placing Hydrant No. 1* .....	111		
Placing Hydrant No. 2 .....	175		
Placing Hydrant No. 3 .....	75		
Laying pipe to connect hydrant No. 3 with old main near Print Shop....	143		
Placing Hydrant No. 4 .....	71		
Placing Hydrant No. 5 .....	74		
Changing pipe line in 23rd St. (Less credit for old pipe) .....	52		
Miscellaneous .....	211	\$1,195	\$4,000 .....
	<hr/>		\$4,000

1917 1918 Biennial

## BUILDING IMPROVEMENTS:

## Science Hall—

## First floor—

Changes and additions required in rooms 101, 102, 103, 104, 105 and 106, including shelving in the different rooms and vault, changes in certain equipment and fixtures, closet for janitors under stairway, etc. .... \$ 851

\*Numbers refer to hydrants as numbered on campus blue prints.



**Second floor—**

Changes and additions required in  
rooms 201, 203 and hall, includ-  
ing table and chairs for labora-  
tory, desk lights, etc..... 170

**Third floor—**

Changes and additions required in  
rooms 301, 302, 303, 309, 310,  
311 and 312, including shelving,  
sink, and water connections,  
electrical connections, new  
tables, etc. ....\$1,885 \$ 2,906

**Men's Gymnasium—**

Finishing all the following unfin-  
ished rooms in the Men's Gym-  
nasium, work including flooring,  
interior woodwork, lathing and  
plastering, tinting, electric wiring  
and fixtures for each room listed:

Northwest room, first floor..	352
Locker room, west main stairs, second floor .....	451
East room, second floor.....	1,122
Southeast room, third floor, aux- iliary gym. ....	743
Locker and shower room and toilets, basement room, north- east corner .....	1,471
Store room, third floor, south- east .....	386
East toilet room, third floor....	860
Southeast room, third floor....	75 \$ 5,460

**Miscellaneous—**

Improvements to other buildings, includ-  
ing installation of dirt chutes, janitorial  
rooms, freight and express delivery and  
storage rooms, etc. .... 2,675

Total..... \$11,041

The estimate above for building improve-  
ments is arbitrarily reduced to..... \$6,000 \$1,000 \$7,000

1917 1918 Biennium

**CAMPUS:****Drives—**

Service drives rear Agricultural Hall.....	\$ 250	\$ 250
Service drive to Men's Gymnasium.....	\$ 155	155
26th St. extension s. to railroad track.....	1,320	1,320
Road n. Home Economics Bldg. connecting 26th and 23d Streets .....	800	800
Road w. Armory s. to Service yard.....	750	750

## ESTIMATES OF REQUIREMENTS

165

**Walks—**

Cement walks on 23d St. to Home Economics Bldg. and n. to property line.....	449	....	449
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**Grading, Seeding and Planting—**

Lawn w. Agricultural Building .....	....	175	175
Lawns around Home Economics Building...	110	....	110
Nursery stock, later planting .....	200	....	200
Plantings s. Ath. ....	300	....	300
50 European lindens in parking on Monroe Street .....	75	....	75
Planting around Mines Building .....	90	....	90
Work on west quadrangle .....	200	....	200
Planting around Dairy Building .....	150	....	150

**Miscellaneous—**

Grading, seeding, planting, and improvements to walks and drives .....	....	1,000	1,000
	<u>\$3,279</u>	<u>\$2,745</u>	<u>\$6,024</u>

**MISCELLANEOUS IMPROVEMENTS:****Animal Husbandry Department—**

1917 1918 Bien-nium

Emergency improvements and alterations, barns, and yards.....\$	200
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**Dairy Husbandry Department—**

Treating cement floors, first floor Dairy Bldg. to prevent dust and to make water-proof, installation additional cement floors, safety devices and dairy machinery, etc.\$	425
Remodeling of west wing of dairy barn, re-flooring sections of barn, installing concrete mangers, providing stairs and gravel for yards and lots, etc. ....	1,683 1,928

**Drainage and Irrigation Department—**

Extension and improvements, irrigation-drainage system, including irrigation well for river-bottom farm .....	200
---	-----

**Poultry Husbandry Department—**

Poultry houses and misc. improvements, fences, yards, etc. ....	450
---	-----

**General and Miscellaneous for all Farm**

Departments .....	400
	<u>\$3,178</u>

The above total is arbitrarily reduced to..... \$ 1,500 \$1,000 \$ 2,500

Great total improvements ..... \$14,779 \$4,745 \$19,524

## V—Equipment.

Summary of equipment required for the biennial period 1917 and 1918.

		1917	1918	Biennium
Business Office .....	\$	600		
Registrar's Office .....		333		
Agriculture—				
Office of Dean and Director....	\$	100		
Animal Husbandry .....		2,000		
Bacteriology .....		1,000		
Botany and Plant Pathology....		750		
Dairy Husbandry .....		2,000		
Drainage and Irrigation .....		1,000		
Entomology .....		300		
Farm Crops .....		600		
Farm Mechanics .....		600		
Horticulture .....		570		
Poultry Husbandry .....		500		
Soils and Farm Management...		850		
Veterinary Medicine .....		350		
Zoology and Physiology .....		250		
			\$10,870	
Engineering—				
Mechanical Engineering and				
Dean's Office .....		200		
Civil and Highway Engineering		1,030		
Electrical Engineering .....		1,500		
Experimental Engineering .....		3,000		
Industrial Arts and Shops .....		3,000		
Irrigation Engineering .....		400		
			\$ 9,130	
Mining .....		2,500		
Home Economics—				
Domestic Art .....	\$	200		
Domestic Science .....		30		
			\$ 230	
Forestry and Logging Engineering ....		700		
Commerce—				
Business Administration				
(Dean's Office) .....	\$	50		
Political Economy .....		172		
Political Science .....		72		
			\$ 294	
Pharmacy, Department of .....		401		
Service Departments—				
Art and Rural Architecture .....		300		
Chemistry .....		2,000		
English .....		282		
History .....		100		
Industrial Education .....		105		
Physics .....		360		
Library .....		273		
Physical Education for Men .....		500		
Physical Education for Women .....		500		
Military Department .....		250		
College Exchange .....		500		
Miscellaneous .....		1,000		
Total for biennium .....		\$31,228		
Totals .....		\$15,614	\$15,614	\$31,228

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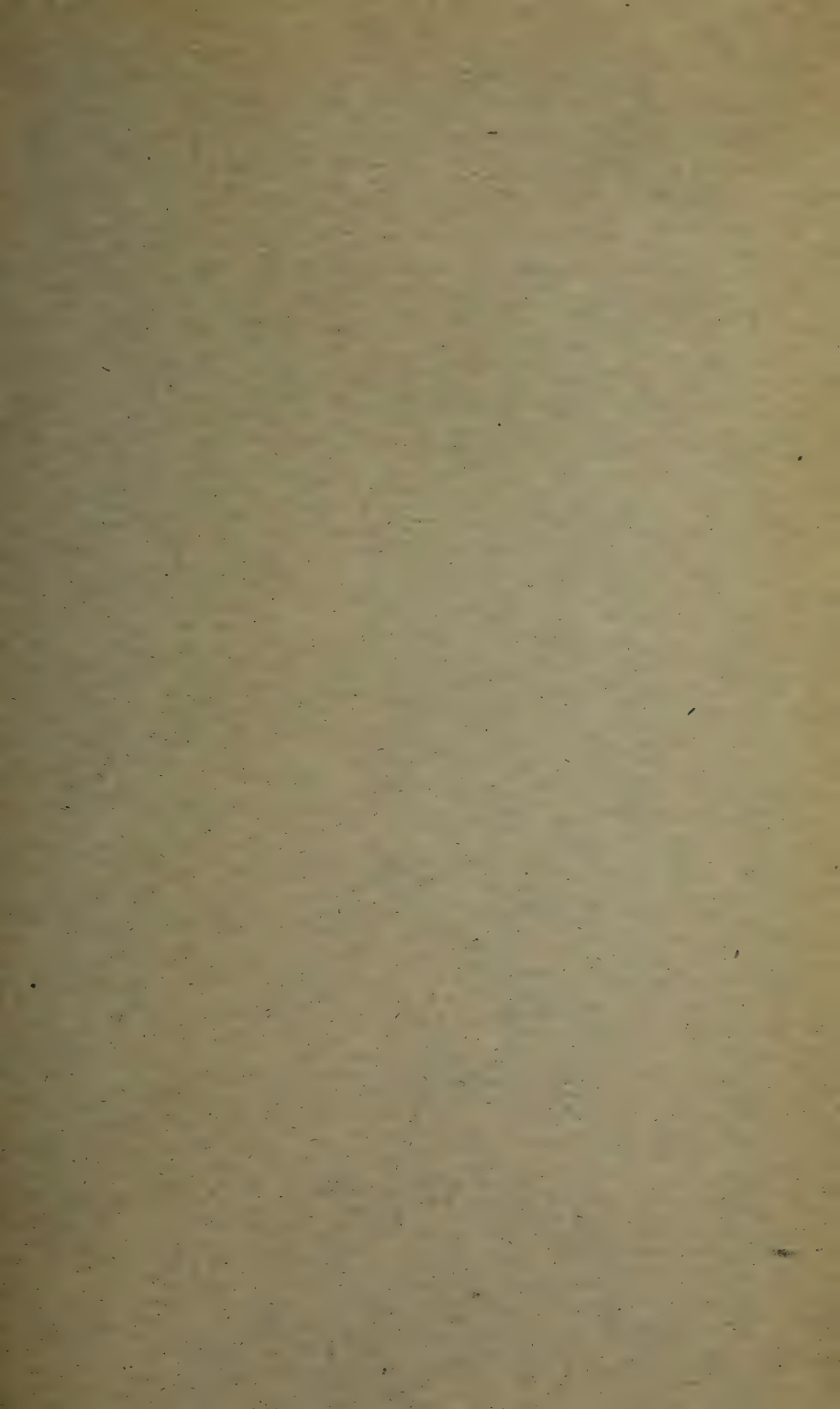
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# Oregon Agricultural College Bulletin

Biennial Report of the  
Board of Regents  
1916-1918



CORVALLIS, OREGON





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1916-1918



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*Honorable James Withycombe,  
Governor of the State of Oregon.*

*Sir:*

In accordance with the law, I herewith submit the report of the Board of Regents of the Oregon State Agricultural College for the biennial period ending December 31, 1918, including the report of the President of the College and the appended reports of the Treasurer and of the Director of the Experiment Station and other officers.

Respectfully submitted,

J. K. WEATHERFORD,

President of the Board of Regents.

January, 1919.





# OREGON AGRICULTURAL COLLEGE

## PRESIDENT'S BIENNIAL REPORT

### 1916-1918

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To the Board of Regents:

The President of the College has the honor to submit to the Board of Regents his report for the years 1916-17 and 1917-18. In previous biennial reports, particularly the reports for 1906-08, 1910-12, 1912-14, and 1914-16, there were presented at considerable length various questions relating to the purpose and scope of the College, its place in the educational system of the State, its policy, organization, and courses of study; the sources of income, and the relation of the College to the Federal Government and the State. For information upon any phase of these questions reference may be made to the different reports. Detailed information regarding student enrollment, College finances, and the work and needs of the Agricultural Experiment Station, the Extension Service, and the various schools and departments throughout the institution, may be found in the appended reports and in official College publications which are submitted as a part of this report.

### STUDENTS

The distribution of enrollment among the different courses is indicated in the following table, which, for purposes of comparison, covers the four years, 1914 to 1918, inclusive.

Notwithstanding the fact that a large number of regular students were engaged in war service, it is to be noted that there was a decrease in 1917-18 as compared with 1916-17 of

only 47 regular degree-course students; also that there were actually registered more freshmen and sophomores in 1917-18 than in the preceding year, and only 16 fewer juniors and 31 fewer seniors. The falling off was largely in the vocational and special courses, though there were 36 fewer graduate students.

	1914-15			1915-16		
	Men	Women	Total	Men	Women	Total
Agriculture .....	540	7	547	550	6	556
Engineering .....	297	.....	297	312	.....	312
Forestry .....	83	.....	83	76	.....	76
Commerce .....	116	54	170	131	46	177
Home Economics.....	.....	371	371	.....	354	354
Pharmacy .....	54	7	61	60	9	69
Optional .....	6	21	27	3	50	53
Music .....	16	57	73	12	54	66
	1112	517	1629	1144	519	1663
Summer School.....	75	133	208	95	142	237
Short Courses.....	1405	934	2339	793	572	1365
	2592	1584	4176	2032	1233	3265

	1916-17			1917-18		
	Men	Women	Total	Men	Women	Total
Agriculture .....	569	7	576	419	6	425
Engineering .....	364	1	365	318	1	319
Forestry .....	85	.....	85	59	1	60
Commerce .....	149	63	212	112	186	298
Home Economics.....	.....	412	412	.....	413	413
Pharmacy .....	57	6	63	44	24	68
Optional .....	8	53	61	3	24	27
Music .....	16	31	47	16	42	58
	1248	573	1821	971	697	1668
Summer School.....	144	223	367	96	268	364
Short Courses.....	1002	608	1610	967	452	1421
	2394	1404	3798	2034	1417	3453

As shown in the report of the Registrar, the student enrollment during each year of the biennium covered by this report represents every county in Oregon; in the year 1916-17, 35 other states and 15 foreign countries; in 1917-18, 32 other states and 8 foreign countries. During the first year of this period the number enrolled from Oregon was 1,271; from other states, 512; from foreign countries, 38. During the second year of this period the number enrolled from Oregon was 1237; from other states, 405; from foreign countries, 26.

**Geographical  
Distribution**

During the year 1916-17, eighty-one percent of the entire student body were partly or wholly self-supporting; and in 1917-18, seventy-seven percent. Of these, in 1916-17, forty-two percent were entirely self-supporting, twenty-seven percent half self-supporting, and twelve percent less than half self-supporting. Only nineteen percent of the entire student body were in no degree dependent upon their own efforts for support. In 1917-18, thirty-nine percent were entirely self-supporting, twenty-seven percent half self-supporting, and eleven percent less than half self-supporting. In that year twenty-three percent were not self-supporting in any degree.

**Students  
Self-supporting**

The occupational representation of parents or guardians runs practically the same for the two years, the proportion being in the order named: agriculture, miscellaneous business, skilled labor, unskilled labor, retired, mercantile, professions, financial and semi-legal, government service, railroading, business management, manufacturing, artistic professions, scientific.

**Occupations  
of Parents**

For the year 1916-17 the average age for men students was 19; for women students, 20. For the year 1917-18 the average age for men students was 20; for women students, 19.



For the two-year period, 1916-17 and 1917-18, 157 high schools and 26 colleges and universities of Oregon were represented among the student body. From the Oregon high schools came 508 and 515 students, respectively; and from the Oregon colleges and universities, 33 and 39 students, respectively. Twenty-nine high schools and 27 colleges and universities of other states were represented, with 227 and 185 students respectively from the high schools, and 85 and 71 students respectively from the colleges and universities. Seven high schools and two colleges and universities of foreign countries were represented, with 9 students each year from the high schools and 3 and 1 respectively from the colleges and universities. The total number of high schools represented was 193; the total number of colleges and universities was 55. The total number of students from high schools for the two years was 744 and 709 respectively, and the total number from colleges and universities was 121 and 111 respectively.

**High Schools,  
Colleges, and  
Universities  
Represented**

Complete lists of the graduating classes are given in full in the Registrar's report. The number in the graduating class of 1917 was 281. Of these, 9 received the Master of Science degree, 245 the Bachelor of Science degree, 2 the Music Diploma, and 25 the Vocational Certificate. The number in the graduating class of 1918 was 216. Of these, 5 received the Master of Science degree, 187 the Bachelor of Science degree, 1 the Music Diploma, and 23 the Vocational Certificate. During the two years, of the number receiving degrees, 78 had transferred from other colleges and universities; in 1917, 37, representing 13 percent of the number in the graduating class; in 1918, 41, representing 19 percent of the graduating class. In the graduating class of 1917 there were 204 representatives from Oregon, 71 from other states, 6 from foreign countries. In the graduating class of 1918 there were 155 from Oregon, 55 from other states, 6 from foreign countries.

**Graduates**

## FACULTY

The College staff is classified into the three groups required for the work of Resident Instruction, the Agricultural Experiment Station, and the Extension Service. Exclusive of the President, the general administrative officers, and general and miscellaneous appointees, there were for the year 1916-17 in the resident instructional force, 6 deans, 39 professors, 8 associate professors, 26 assistant professors, 63 instructors, and 11 fellows and assistants, representing the full-time equivalent of 137. The Experiment Station staff, including the superintendents of branch stations, aggregated 44, representing the full-time equivalent of 23.23 persons. The number of persons giving part or full time to the Extension Service was 64, representing the full-time equivalent of 44.875 persons. For the year 1917-18, on the same basis, the resident instructional force comprised 9 deans, 39 professors, 13 associate professors, 25 assistant professors, 60 instructors, 10 fellows and assistants, and 3 research assistants, representing the full-time equivalent of 131.27 persons. The Experiment Station staff, including the superintendents of branch stations, aggregated 56, representing the full-time equivalent of 28.57 persons. The number of employees giving whole or part time to the Extension Service was 75, representing the full-time equivalent of 48.83.

Withdrawals from the staff have been particularly heavy during the biennial period covered in this report. A considerable number of men of military age withdrew to enter the military service. The following summary gives by rank the resignations for the years 1916-17 and 1917-18.

	Resignations	1916-17	1917-18
Directors or deans.....		1	1
Professors .....		1	4
Associate professors.....		1	1
Assistant professors.....		6	7
Instructors .....		11	21
Assistants .....		2	5
Fellows .....		7	5
Extension workers.....		5	2
County agriculturists.....		3	10
Branch experiment station employees.....			3
Office employees.....		23	30
Miscellaneous .....		6	16
		<hr/>	<hr/>
Total .....		66	105
			171

## STUDENT LOAN AND SCHOLARSHIP FUNDS

The Student Loan Fund, established in 1911, has been of great assistance in helping worthy students, many of whom without such aid would not be able to continue their courses.

**The Student  
Loan Fund**

In the Treasurer's report appended hereto is a detailed statement of the loan fund for the past biennial period. The fund has grown from year to year until on December 1, 1918, it aggregated \$7,844.81, representing contributions made from year to year by friends of the College in the aggregate of \$6,698.79, and accumulated interest since the establishment of the fund totalling \$1,146.02. Up to December 1, 1918, 568 different loans have been made, totalling in the aggregate \$20,939.55, or an average per loan of \$36.86. Loans are for the most part short time and so far as practicable are made payable during the first term of the college year in order that the money may be available for loan to other needy students.

There was established a year ago what is known as the "L. J. Simpson Scholarship Loan Fund," made possible by the gift of \$2,000 to the College by Mr. L. J. Simpson, of North Bend, whereby five annual scholarship loans of \$100.00 each, continuing through the four years of the student's college course, will be awarded to worthy students whose needs justify the awards.

**The Simpson  
Fund**

The late Captain J. T. Apperson, regent of the College from the date of its establishment as a state institution to the time of his death, provided in his will that a part of his fortune should go to a fund for the benefit of worthy students of the Oregon Agricultural College in the form of a perpetual endowment administered by the State Land Board of Oregon and known as "The J. T. Apperson Agricultural College Educational Fund." This fund is to be loaned to worthy young men and women "who are actual bona fide residents of the State of Oregon and who would otherwise be unable to bear the expense of a college course in the Oregon Agricultural College." The income of this estate is to be loaned to students at a low

**The Apperson  
Fund**



rate of interest. Applicants for loans must be recommended by the State Land Board and by the President of the College and the State Superintendent of Public Instruction.

## BUILDINGS

During the biennial period new buildings have been constructed, additional equipment purchased, and other improvements made to the extent feasible with available funds. The

**Forestry Building** Forestry Building was completed for occupancy in September, 1917. The cost of this building was \$44,500. It is constructed of brick with light gray terra cotta trimmings and is 80 feet wide by 136 feet long. The building comprises a high, airy basement and two stories. The basement accommodates two large laboratories for logging engineering. The first floor accommodates the mensuration laboratory and several classrooms and offices, including the offices of the Dean of the School. The second floor includes the laboratories for technology, dendrology, silviculture, and drafting. The building at present serves the needs not only of the School of Forestry but of the School of Vocational Education and the department of Poultry Husbandry.

The Library Building was completed for occupancy in September, 1918, the aggregate cost, exclusive of equipment, being \$120,961. This building is ample to accommodate the growth of the library for many years, its architecture being such as to permit of stack expansion as time and growth demand. The building consists of two stories and basement in front and three stories and basement in the rear. It is constructed of red brick with gray terra cotta trimmings, and is equipped with a thoroughly modern heating and ventilating system, as well as a modern lighting system. The first floor consists of an entrance hall, two large lecture rooms, library work rooms, two smaller class rooms, and cloak rooms for students. The second and third floors at the front accommodate the large main reading room, which will seat three hundred persons. Back of this room on the second floor are the offices, cataloguing room, and other library work rooms. The third floor

**Library Building**



consists of several smaller seminar rooms and offices. The fire-proof stack room occupies the northwest corner of the building extending from the basement to the roof. The building throughout is admirably suited to its purpose.

The legislature of 1917 appropriated \$65,000 towards the construction of the Library Building. At the time the appropriation was made, it was thought that the building might be constructed in units, and that the appropriation of \$65,000 would provide for one of the units. As plans developed, however, it was found impracticable and inadvisable to undertake the construction of the building on a unit plan; and the Regents, after careful consideration, authorized the construction of the building, leaving unfinished the stack room, the basement, and some other rooms less urgently needed. Receipts from the millage tax in the amount of \$55,961 were used to supplement the special appropriation of \$65,000.

Two smaller buildings for the agricultural work were constructed during the biennial period—a hog barn, at a cost of \$5,520; and the Veterinary Clinic Building, at a cost of \$9,867. The Horticultural Products Building was constructed, leaving unfinished a considerable part of the interior work, at a cost of \$15,332. As soon as funds are available, the interior will be completed.

The Corvallis residence of Governor James Withycombe was purchased by the College for use as a Practice House by the School of Home Economics, at a purchase price of \$6,000. This property, adjoining the main campus, is most advantageously situated.

## AGRICULTURAL EXPERIMENT STATION

The work of the Agricultural Experiment Station is fundamental in the agricultural development of the State. Oregon soil and climatic conditions present many problems that are unique and that must be solved in order that the State may develop its great potential wealth. Progress in agricultural instruction at the College and efficiency in the Agricultural Extension Service depend upon the results achieved by the research specialists at the experiment stations.

Reduction in the funds available for maintenance and greatly increased costs of operation have seriously restricted the work of the Experiment Station, as pointed out by the Director in his report. Withdrawal of free transportation on the railroads, moreover, and an advance of sixty percent in the cost of publishing reports, and equal or greater advances in the cost of labor, equipment, and supplies, have also handicapped the work of all the stations.

**Reduction of  
Funds and Buying  
Power, a Handicap**

As a consequence, investigational work has of necessity been confined to restricted projects already under way, to the neglect of many others that are crying for attention in the interests of the people. Among the latter are included the Cost of Milk Production; study of Poisonous Range Plants, which annually cause losses to stockmen of \$150,000; attention to such important diseases of livestock as contagious abortion, hemorrhagic septicemia, and "walking disease;" soil investigations, including soil surveys and programs of soil fertility; reclamation investigations; land-clearing problems; and investigations with cereals, including "pinched wheat," "frosted wheat," the gluten test of milling quality, and storage problems. While something has been done with all these problems—as much as possible under the circumstances—they have not been given the attention they abundantly deserve. Nor can they until funds are increased.

**Investigations  
Restricted by  
Lack of Funds**

In spite of reduced income, however, and reduced buying power of that income, notable results have been attained. Investigations in egg production have been so successful as to attract world-wide attention. Cereals tested at the Moro Dry-Farm Branch Station have revealed four new varieties of spring wheat that yield an average of from 20 to 30 percent more than the best local spring varieties, with milling qualities superior to Bluestem, the best local variety. Experiments with sulfur as a fertilizer for alfalfa in Southern Oregon have been so successful that the farmers of a single community have purchased sulfur to fertilize over 4,000 acres. An increase of but two tons to the acre, which is moderate, would

**Notable Results  
Achieved in  
Wide Field**

yield to this community an increased income larger than the annual cost of all experiment station work in the State. In livestock investigations, among ten or a dozen important projects the feeding experiments may be taken as typical. Short feeding of steers with the lighter grains, alfalfa, and silage produced gains so rapid and economical that results were questioned, and the tests continued. Three years' work seems to confirm the results as due to the peculiar system of feeding, however, and if tests still in progress verify these results the feeding of silage with alfalfa hay will become an important factor in livestock production.

It is impossible to review here the substantial results of all the work of the Experiment Station in Dairy Husbandry, Horticulture, Soils, Irrigation and Drainage, Field Crops, and other important branches of research. By consulting the appended report of the Director of the Experiment Station, however, information may be found showing the breadth and economic worth of this service to the people of the State.

### EXTENSION SERVICE

Agriculture and home economics are the chief fields covered by the Extension Service, though engineering and other studies that help to enrich the industrial or rural life of the State are also given attention. The project basis of work has been regularly adopted as productive of most satisfactory results. The work during the biennium has not only expanded remarkably and achieved practical results of large substantial value, but has related itself to the occupational and home life of the industrial and rural people in such a way as to be of permanent constructive value.

Sixteen projects, as listed on page 33, form the basis of work in Oregon. To carry on this enlarged program the number of persons on the Extension staff devoting full time to the work increased from 33 to 65; the number giving from one-fifth to one-half time to the work remained about stationary, at 20; while many other faculty members devoted a smaller proportion of their time to Extension duties.

Related to  
Occupational  
and Home Life

A Rapidly  
Expanding  
Program



**Publications** totaling 180 in number and including 1,117 pages, 160 illustrations, and an aggregate issue of 688,750 bulletins, were issued during the biennium at an expense of \$5,649.58.

**Extension Schools** held in 15 different communities, served 8,527 people in 17 counties.

**Farmers' Week** gatherings in 1916 and 1917 brought to the College an aggregate of 3146 people, representing every county in the State.

**The County Agents**, aside from war work, have done much, in cooperation with the farm bureaus, in conducting agricultural surveys, promoting food production and food conservation, land reclamation, soil improvement, bulk handling of grain, livestock improvement, and soil fertility, especially in the use of sulfur for alfalfa meadows.

**Home Demonstration Agents.** While only a single home demonstration agent was regularly employed at the beginning of the biennium, ten were in the field at its close, and the success of the movement, especially in connection with war service, was such as to commend it to all progressive communities.

**Industrial Club Work** steadily advanced in importance and interest during the biennium, 16 counties showing their faith in the work by establishing paid club leaders to make the work more thorough and continuous. The aggregate gains of boys' and girls' club work from the standpoint of food production alone amounted to over twenty thousand dollars; but the benefit to the young people, in scientific knowledge, habits of thrift, community service, and faculty for leadership, is of vastly greater value.

**Extension Demonstration.** Horticultural demonstrations, especially in pruning and spraying orchards, have resulted in much wider use of approved practices, at a notable economic gain. Results of the spraying program demonstrated by extension workers, have resulted in a gain of \$100.00 per acre as compared with unsprayed check plots.



Regular projects in Animal Husbandry, Dairying, Poultry Husbandry, Agronomy, Farm Management, Organization and Markets, the agricultural sciences, and farm labor, are reported briefly in the appended summary of the Director of Extension Service, who also reports the results of Engineering Extension, a project in which the College was a pioneer among the technical colleges of the country.

The recommendation of the Director of the Extension Service for authorization and adequate support to carry on correspondence courses in Agriculture, Home Economics, and the other fields of instruction peculiar to this institution, should have thorough and sympathetic attention. So should his recommendation for the important work of visual instruction, which, though a comparatively new field, has abundantly proved its worth as a means of serving the people. The field of Engineering Extension, also, in which the College took the initiative, has proved so fertile a means of promoting the interests of shop men and practical engineers (see page 47) that the work has been adopted by many engineering colleges throughout the country and vigorously expanded. The Oregon Agricultural College should be in position to carry forward the remarkably productive courses in Engineering Extension that it inaugurated in 1915 and that have been so highly appreciated not only by the men who directly profited by the training but by the whole group of practical engineers. With adequate funds this work could be made of vast importance to the mechanical and engineering vocations of the State.

Correspondence  
Courses, Visual  
Instruction, and  
Engineering  
Extension

### COLLEGE FINANCES

The appended report of the College Treasurer gives an account of the receipts and expenditures during the biennium for all phases of the work of the College. Since each of the three main divisions of the College—Resident Instruction, Agricultural Experimental and Research work, and Extension Service—is financed entirely independently of the other two, separate reports are submitted of the receipts and expenditures for each of these divisions.

In previous biennial reports have appeared complete statements of the various sources of the income of the College, including the acts of Congress and of the State Legislature providing for the support of the different divisions of the work of the institution and the amounts received under each. It is not deemed necessary to repeat these statements in the present report.

As a matter of understanding, however, attention should be called to the fact that no part of the appropriations provided for one division of the College can be utilized in support of another. Appropriations for the Branch Experiment Station work, for instance, cannot be used, directly or indirectly, for work at the College proper. The same is true of funds provided for different phases of the Extension Service. All the work of Resident Instruction, of the Agricultural Experiment Station, and of the Extension Service, must be paid for from funds provided respectively for these divisions. In cases where the time of members of the staff is divided between any two of these divisions, their salaries are adjusted accordingly. Some members of the staff, for example, divide their time between the Experiment Station and Resident Instruction, or between Resident Instruction and the Extension Service; but only the actual time devoted to the work of each division can be paid for from the funds provided for that division.

For the next biennial period, 1919-1920, it will be necessary, if the work of the College is to be maintained and advanced, that funds be provided to supplement the millage-tax receipts. Notwithstanding the far greater demands upon the institution in caring for increased enrollment with costs considerably in advance of normal, the income from the millage tax is less than the income during the first year of the operation of the law (1915). There has also been a very large increase in cost of maintenance, including supplies, fuel, labor, printing, etc.

A report has been filed with the Secretary of State giving details and explanations of the requirements for the next biennium. While it would not be consistent to include so lengthy a statement in the present report, the following recapitulation of requirements and income may be given:

**Appropriations  
Not Inter-  
changeable**

**Resident  
Instruction**

## 1. RESIDENT INSTRUCTION

Income	1919	1920	Biennium
<i>From the State</i>			
Millage tax, \$0.0004 on basis of \$927,750,000 valuation.....	\$371,100	\$371,000	\$ 742,200
<i>From Federal Government</i>			
Morrill-Nelson funds.....	50,000	50,000	100,000
Interest, Land-Grant fund.....	11,500	11,500	23,000
Smith-Hughes fund.....	5,000	5,000	10,000
<i>Miscellaneous</i>			
Entrance fees and net sales.....	11,500	11,500	23,000
	<hr/> \$449,100	<hr/> \$449,100	<hr/> \$ 898,200
<b>Requirements</b>			
(1) Salaries .....	\$374,325	\$393,041	\$ 767,366
(2) Miscellaneous maintenance..	117,625	115,725	233,350
(3) Repairs .....	10,000	10,000	20,000
(4) Library books.....	5,000	5,000	10,000
(5) College Exchange.....	5,000	5,000	10,000
(6) Farm maintenance.....	8,000	8,000	16,000
(7) Equipment .....	10,000	10,000	20,000
(8) Improvements .....	4,000	4,000	8,000
(9) Contingencies .....	10,000	10,000	20,000
	<hr/> \$543,950	<hr/> \$560,766	<hr/> \$1,104,716
Excess of requirements over income .....	\$ 94,850	\$111,666	\$ 206,516

Thus it will be observed that without any allowance for new buildings and with most conservative estimates for equipment, improvements, etc., additional appropriations for Resident Instruction will be necessary amounting to \$94,850 for 1919 and \$111,666 for 1920, not including the special appropriation that may be required for the construction of barracks and the emergency appropriation authorized by the State Emergency Board covering the last quarter of the present biennium (October, November, December), amounting to \$37,433.

## 2. AGRICULTURAL EXPERIMENT STATION

The annual appropriation of \$25,000 for the Agricultural Experiment Station, repealed by act of the State legislature in 1915, should be restored. Even this would not make possible any expansion of the Station work but would all be required in covering the increased cost of transportation, publication of bulletins, labor, equipment, and supplies. A Federal representative who spent several days at the College during last July inspecting the work of the Experiment Station reports that "present

**Agricultural  
Experiment  
Station**



conditions are impossible and additional money must be provided from some source" in order that expenditures that cannot be paid from Federal funds may be provided for. The appropriations for the support of the experiment stations in Hood River and Jackson counties should be increased by \$1000.00.

### 3. EXTENSION SERVICE

The legislature of 1915 adopted a resolution assenting to the provisions of the Smith-Lever Act of Congress appropriating money for agricultural and home economics extension work in the several states. The Federal Government required that above the initial appropriation of \$10,000 the amount available to each state must be duplicated by the state. The Oregon legislature, however, failed to make any provision for meeting this requirement. In order to receive the Federal appropriation, therefore, it has been necessary during the intervening years to draw upon the general Extension appropriation of \$25,000. For the present year, 1918, the amount so drawn is \$15,562. The amounts of these appropriations for the 1919-1920 biennium would be \$38,535.12. Since the general Extension appropriation of \$25,000 by the State is the only money available for meeting expenditures for which other Extension funds cannot be used, it is apparent that it will be necessary during the next biennium for the State to provide funds, in part at least, with which to duplicate the Smith-Lever appropriation. The limitations imposed by the Smith-Lever Act and the regulations adopted by the Federal officials administering the Act are such, in fact, that in maintaining the Extension program a large part of the general State appropriation will be necessary in meeting Extension requirements which cannot be met with Smith-Lever funds. For the present an allowance of \$10,000 a year to apply on the amount required to duplicate the Smith-Lever appropriations may be sufficient.

Respectfully submitted,

W. J. KERR,  
President

Extension  
Service





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## REPORT OF THE SCHOOL OF AGRICULTURE.

To the President of the College,

Sir: During the past two years the School of Agriculture has been called upon to reconcile the demands of the class room and laboratory with the two-fold duty of giving the nation the maximum assistance in food production and in military service. With records quite incomplete it is known that nineteen members of the faculty of the School of Agriculture and nearly three hundred students who were registered in Agriculture during the college years of 1916-17 and 1917-18 are in military service. It is hardly necessary to add that the rapid development of instructional work mentioned in previous reports did not continue through the biennium.

**Vocational Courses.** Vocational courses have not been as popular as was anticipated. The general satisfaction expressed by both instructors and students, however, with the grade of work done in these classes is encouraging. The value of such courses to young men who for any reason cannot pursue the degree courses is so evident that they have been continued. It is contemplated to make them even more strictly vocational in the future than in the past and a systematic effort will be made to bring them to the attention of such men as can best profit by them. It is believed that they are especially adapted to the needs of returning soldiers who desire a brief course of practical training in agriculture.

**Degree Courses.** The revised degree courses have proved to be so satisfactory that only minor changes have been made in them and these have had to do with the organization of the work rather than with the subject matter. The work in farm management has been strengthened by giving it departmental rank, and the work in drainage and irrigation has been united with that in soils and organized into a Department of Soils. Experience having indicated that the requirements for graduation were too narrowly specialized to meet the needs of some students, especially those who transferred to the College from other colleges and universities, provision has been made whereby students who preferred not to specialize may, with the approval of the Dean, take a course in General Agriculture with a wide range of electives.

**Increased Facilities.** The facilities for instruction and research have been materially increased by the completion of the Horticultural Products Building and the Veterinary Building, although neither of these buildings has as yet been fully equipped. More convenient, though temporary, facilities for handling the horses have been provided and the dairy barn has been remodeled to accommodate the rapidly increasing dairy herd and to adapt it more perfectly to experimental work.

**Recommendations.** Many students whose education was interrupted by the call to military service will return as soon as possible to complete their college courses. It is assumed that at least the normal number will enter College from high schools and other colleges and universities and



that the combined registration of old and new students in agriculture for the year 1919-20 will be not less than 600. Any estimates which are made for the biennium should make provision for at least that number.

**Instructional Force.** With the return of those members of the faculty who were granted leave of absence for the period of the war, few if any additions to the instructional force will be necessary.

**Additional Equipment.** Provision should be made, however, for the necessary additional equipment. Owing to lack of funds, practically no equipment has been purchased during the past three years. Reports of heads of departments on file in this office show urgent need of such equipment aggregating not less than \$15,000.

**Seed Storage Building.** The most urgent need of the School of Agriculture at present is a seed-storage building in which to handle and store the hundreds of varieties under experiment; to house the improved and standard varieties of seed which are for sale by the various departments and which are demanded in increasing quantities each year; and to provide a place for experiments in the storage of cereals and root crops as well as seed stock of root crops and tubers. At present much of the farm machinery remains out of doors in order that the machine sheds may be used for storage purposes. It is estimated that a satisfactory building can be provided at an expense of from three to four thousand dollars.

**Greenhouses Needed.** The next most urgent need is for more adequate greenhouse facilities. The popular conception of a greenhouse is a structure in which to force truck and florist's crops. Greenhouses for instructional and experimental purposes have a much wider range of usefulness. For the instructional and especially for the research work in soils, soil physics, soil fertility, soil chemistry, and soil bacteriology—in plant nutrition, in plant disease, in economic entomology and in plant breeding—greenhouse space is absolutely essential for the best work. The present range of greenhouses is entirely inadequate. Little or no space is available for important investigations. Plans have been prepared for a modern plant which was originally estimated to cost approximately \$35,000. It is assumed that the entire plant cannot be provided at this time, but I wish to urge that at least one unit of the new plant be erected at the earliest date possible. No other expenditure of any equal amount of funds would add more to the facilities for instruction and research in agriculture than that required for the erection of one section of the plant desired.

**More Land Required.** The College is now renting approximately 620 acres of land for farm purposes. Rental of land for College use is not economical, satisfactory, or safe. It is not economical because of high rental; it is unsatisfactory because permanent experimental plots and systems of farming cannot be established; it is not safe because of the fact that land most needed may be sold or renewal of the lease refused. While it is not necessary and certainly not feasible that all of the acreage needed be purchased at once, I wish to urge that some fund be set aside each year for the purchase of the most essential tracts.

**Improvements Needed.** The following farm improvements should be made as soon as possible. In explanation of the large amount required

for fencing, attention is called to the fact that very little has been done on the College farm during the past ten years.

Anyone who is acquainted with the College farm will recognize the need of completing the drainage system; while the experimental irrigation system is in such a dilapidated condition that it has been almost impossible to use it for the past two seasons.

Fencing:

For South Farm .....	\$950
For College Farm.....	480
Paddocks at Dairy and Veterinary Bldgs.....	575
Drainage, College Farm.....	500
Irrigation System, College Farm.....	650
Roads:	
South Farm .....	425
College Farm .....	350

Respectfully submitted,

A. B. CORDLEY,

Dean of the School of Agriculture.

## REPORT OF THE EXPERIMENT STATION.

To the President of the College,

Sir: In the following pages I shall present a brief statement of experiment station problems and aims rather than report the results of experiment station work. With this report are submitted copies of the sixteen bulletins published during the biennium, which give a much more adequate idea of the nature and progress of the work than is possible in a brief report.

The Oregon Agricultural College Experiment Station includes the home station at Corvallis and the following seven branch stations:

Southern Oregon Branch Experiment Station, Talent, Oregon.

John Jacob Astor Branch Experiment Station, Astoria, Oregon.

Hood River Branch Experiment Station, Hood River, Oregon.

• Eastern Oregon Dry Farming Branch Experiment Station, Moro, Oregon.

Umatilla Branch Experiment Station, Hermiston, Oregon.

Eastern Oregon Branch Experiment Station, Union, Oregon.

Harney County Branch Experiment Station, Burns, Oregon.

The seven branch stations and the home station are so located as best to serve eight of the most distinctive agricultural sections of the State. The specialists of the home station, so far as limited funds will allow, are at the service of the entire State, including branch stations and county agents. The stations at Talent and Hood River serve particularly the important interests of the Rogue River and Hood River valleys; those at Moro and Burns, the vast interests of the dry land agriculture of the Columbia Basin and Interior Oregon. The station at Astoria is engaged upon problems of tide land and coastal agriculture; those at Umatilla and Burns upon the irrigation problems peculiar to their respective sections; while the one at Union is devoted largely to the important livestock interests of Eastern Oregon.

### EXPERIMENT STATION WORK HAMPERED.

Reduction in the funds available for maintenance and greatly increased operating expenses have seriously restricted the work of the Experiment Station during the past four years.

The home station is maintained by Federal appropriations (\$30,000) provided by the Hatch and Adams Acts and by a State appropriation of fifteen thousand dollars, ten thousand of which is available only to the extent to which it is duplicated by the United States Department of Agriculture.

The Federal appropriation under the Adams Act is not available either for administrative work or for the publication of results obtained, but must be used for strictly investigational work, the outlines of which must be approved in advance by the Office of Experiment Stations, United States Department of Agriculture. The funds received under the Hatch Act are also narrowly limited in their application.

During the biennium, free railway transportation, which was granted by the principal railroads in Oregon for Experiment Station work-

ers, has been withdrawn. The cost of publication of bulletins has increased more than sixty percent; the cost of service and the prices of all kinds of equipment and supplies have so increased that it is absolutely impossible with the funds now available to maintain the work even on its present restricted basis, to say nothing of meeting the increased demands upon the Station for assistance.

Entirely without solicitation, and with the Station unable to respond to it, the demand for experiment station bulletins has increased until our mailing list now includes over 30,000 names. Coincident with this increased demand, the editions have been reduced from 15,000 and 20,000 copies with occasional reprints, to 3,000 or 5,000 copies with no reprints. Not only has the work of the Station been greatly restricted, but results of work done do not reach the farmers for whom they are intended, because of the lack of funds with which to pay publication expenses. It is of great importance that as the work progresses the results obtained be published and distributed for the use of farmers.

To maintain the work of the home Station on its present restricted basis will require an increase of at least ten thousand dollars per annum.

The branch stations at Talent, Astoria, Moro, and Burns were established under a cooperative arrangement by which the respective counties provided the land and buildings, while the cost of maintenance is provided by the State, as at Talent and Astoria, or jointly by the State and United States Department of Agriculture, as at Moro and Burns. At Umatilla the land and buildings were provided by the United States Reclamation Service, the station being maintained jointly by the State and the United States Department of Agriculture. The station at Hood River has no permanent quarters, but is maintained jointly by the State and Hood River county. At Union, the station was established upon land owned by the State, which also provides buildings and maintenance.

The work at most of the branch stations can be maintained for the present on the funds now available. The important work of the Southern Oregon Branch Station, however, has been seriously hampered by lack of land and by insufficient funds. The Jackson county Court, without a single protest, has included in its budget an item of ten thousand dollars for the purchase of additional land for the use of the experiment station and has already purchased a part of the land so much needed. In view of the attitude of Jackson county and particularly on account of the very valuable work being done, I wish to urge that the appropriation for maintenance for the Southern Oregon Branch Experiment Station be increased from five thousand to seven thousand five hundred dollars a year.

I wish to recommend also that an increase from three thousand to four thousand dollars a year be provided for the maintenance of the Hood River Station and that one thousand dollars a year for the years 1919 and 1920 be appropriated for the purpose of clearing, leveling, and draining the tide lands at the Astoria Station.

#### IMPORTANT AND MUCH-NEEDED INVESTIGATIONS IMPOSSIBLE.

The following pages contain a brief descriptive list of the problems which are now under investigation. It should be understood, however, that many of these investigations, important as they are, are practically at a standstill and that it is impossible to prosecute them vigorously with



the present limited appropriations. It is impossible also to undertake other important investigations that are being urgently requested by various agricultural interests. Among the latter may be mentioned the following:

**The Cost of Milk Production.** The need for this investigation is instantly apparent in the discussions on milk production in the newspapers for the past few months. If adequately financed the investigation could be completed in eighteen months' time and the results should be of great value to producers, distributors, and consumers alike.

**Poisonous Plants on the Range.** Poisonous plants are causing to the stockmen of Oregon losses of about \$150,000 per annum. A preliminary investigation of this problem has been undertaken, but the losses are sufficient to justify prosecuting the work already begun more vigorously and the extension of the investigation to include the problem of working out a practical system of herd management which will eliminate or at least minimize the losses.

**Miscellaneous Livestock and Dairy Investigations.** In addition to the above there are many problems of pressing importance, although less general in their interest than those mentioned. Among these are investigations of the actual value of the various kinds of food available to Oregon farmers. This applies to all kinds of feed for livestock, although its importance is not so readily recognized by the general public or even by the farmers themselves. The war demonstrated plainly the very great value of the data which have already been obtained and at the same time clearly indicated the necessity for additional information.

Among the diseases of livestock, in addition to contagious abortion, which need attention are: Walking Disease of horses, prevalent in Umatilla, Moro, and Gilliam counties, and Hemorrhagic Septicemia, which has become more and more prominent, especially in the Coast districts. Control methods for the latter have already been fairly well worked out, but there still remain some points to clear up before the work can be made more effective. Walking Disease, on the other hand, is an unsolved trouble, previous work conducted by various people at different places having been without success.

The depletion of the dairy herds of Europe gives an excellent opportunity for this country to develop the manufacture of foreign types of cheese. The climatic conditions of the coast counties of Oregon indicate that the manufacture of these types of cheese may be attempted there with a greater certainty of success than in any other region known at present.

**Soil Investigations.** The wealth of Oregon rests largely in the soil, and our permanent prosperity depends upon improving or maintaining the fertility of the soil and at the same time securing the maximum net profit per acre.

The detailed soil surveys should be adequately supported and extended to cover the agricultural areas of the State. Soil survey maps serve as a basis for permanent soil fertility and soil water investigations, and provide for the individual farmer definite information regarding the character of his soil and the best means of handling it to retain fertility under maximum production.

The state of Iowa appropriates \$50,000 annually for soil investigations, while Illinois and Indiana each appropriates about twice that amount.

It is fundamentally important that permanent systems of soil management be developed before the virgin fertility of our soils is reduced to the point where profits are uncertain; these systems should provide for maintaining fertility and secure the maximum net profits per acre of land and water.

**Reclamation Investigations.** Eastern Oregon contains millions of acres of fertile soil. An aggregate area of more than 2,800,000 acres has been included in approved irrigation projects. As compared with acreage, available water for irrigation is relatively scarce. It is consequently of fundamental importance to the fullest development of that section of our State that investigations be made to determine the minimum amount of water and the proper methods of handling soils and crops under irrigation. More than 3,000,000 acres of tide lands, swamp lands, and other wet lands in Oregon are in need of drainage. When it is considered that much of this area consists of the most fertile soils in the State, which are now producing little or nothing of value, it is conservative to say that the drainage of 3,000,000 acres would add not less than \$30,000,000 annually to the wealth of the State. No sane business man would care to make the necessary investment of \$50,000,000 to \$75,000,000 without making an exhaustive investigation of every detail of improvement and the probable result. Individual owners cannot well make such investigations. An experiment station could, if the necessary funds were provided.

**Land-Clearing Experiments.** According to estimates recently compiled by the United States Forest Service, the United States Reclamation Service, and the Portland Chamber of Commerce, there are 2,668,402 acres of burnt and logged-off land in Oregon. Much of this land is valuable for farming purposes when cleared. An exhaustive investigation of the most economical methods of clearing this land under Oregon conditions would doubtless yield important results.

**Cereal Investigations.** Probably the most important of these lines of work has to do with the storage, handling, grading, and testing of wheat and with milling and baking tests with the various types now grown in the State.

Wasco, Sherman, Gilliam, Morrow, Umatilla, Wheeler, Jefferson, Deschutes, and Harney counties produce considerable pinched wheat. We do not have authentic information on the relative value of pinched wheat and plump wheat and in its absence farmers must market it to a disadvantage.

Wallowa, Union, Baker, Wheeler, Grant, Klamath, Lake, and Harney counties all produce annually considerable frosted wheat. This wheat is marketed on sample and the farmer has little information as to its value.

Annually, wheat containing more or less smut is unavoidably grown in Oregon. Information is needed to determine the best way of handling this wheat, whether by scouring or washing, and its value in comparison with unsmutted wheat.

Probably the greatest problem is in connection with the milling and baking quality of wheat mixtures such as are commonly found in Oregon.

Wheat having as little as two percent mixture in some cases is discounted three cents per bushel, and five percent in some cases as much as six cents per bushel; when it contains more than ten percent it goes into the class of mixed wheat which practically puts it on a sample basis and largely at the mercy of the buyer.

Information is needed on the moisture, temperature, and time required for tempering various wheat varieties for best milling results.

There is no adequate test for determining the gluten test of milling quality of grain in a reasonably short period of time. We believe that lines of investigational work already started in this department will, if supported, develop into a good test which can be used in the purchase of grain on its real value. This test is particularly important in connection with wheat that is partly hard and partly soft of the same variety, or of mixed varieties.

Storage problems needing solution consist, first, of the exact moisture and temperature conditions under which grain begins to fall; and second, a practical means of increasing the moisture content of grain in our dry sections to market under grade to advantage without resulting in the bleaching of the wheat. The wheat crop of Oregon is annually worth from nine million dollars to thirty million dollars. A conservative estimate of the advantage annually to farmers in the marketing of wheat provided the above information was available is five hundred thousand dollars to one and one-half million dollars, depending upon yield and price for the season.

All of the above investigations in the interest of the important livestock, dairy, reclamation, and cereal crops industries are urgently needed; but they cannot be undertaken with any likelihood of success without additional funds.

#### NOTABLE RESULTS OF EXPERIMENT STATION WORK.

The Experiment Station is a research institution. Its constant endeavor is to learn by investigation; to test, even produce, new varieties, develop new methods, discover new facts and new principles which will be of value in increasing production, decreasing losses, lessening cost of production, and increasing and conserving our greatest natural resource, soil fertility.

As in other fields of investigation, much of the work is valueless. The most carefully planned experiment may yield only negative results. Hundreds, even thousands of selections may be tested before a really superior one is secured. The new method, the new fact, the new principle, developed often at the expense of much labor, may be inferior to the old. Each step in advance may be preceded by many failures; but a single discovery often returns many, many times the cost of all.

**Value of Crop Pest Investigations.** The late E. H. Shepard, a Hood River fruit grower and editor of "Better Fruit," stated editorially that "The apple crop in the Hood River Valley alone will amount to over \$1,500,000 for the year 1916, all of which was sprayed under the direction given by the Experiment Station, being practically free from fungus. Without the method of treatment discovered and worked out and recommended by the Experiment Station, the apple crop of Hood River, on account of scab, would have very little if any market value."



**Results of Cherry Investigations.** One of the cherry orchard sections of the State reported losses of not less than \$150,000 annually by the failure of the orchards to bear. The Experiment Station has solved the difficulty and has assisted in applying the remedy.

**Some Results of Poultry Work.** The Experiment Station began its poultry investigations ten years ago with a flock which averaged 85 to 106 eggs for each hen annually. It has developed large flocks which average more than 200 eggs for each hen annually and has distributed from these high laying strains some ten thousand settings of eggs and two thousand breeding males.

**Dry Farming Investigations.** The Dry-Farming Branch Station at Moro has, for the past seven years, accurately tested hundreds of varieties of grain. Four of the new spring varieties have averaged from 20 percent to 30 percent more than the best local spring varieties, and milling tests show them to be superior to Bluestem, the best local variety. Seed from these varieties is being distributed as rapidly as possible. An increase of one bushel per acre in the yield of spring wheat will add to the wealth of the State annually several times the cost of all of the experiment station work.

**A Result of Soil Fertility Experiments.** The important discovery by the Southern Oregon Branch Station that sulfur used as a fertilizer materially increases the yield of alfalfa, has been found to apply to large portions of the alfalfa growing sections of Southern and Eastern Oregon. The farmers of one community, following demonstrations by their county agent, have purchased sulfur for more than 4000 acres. A moderate increase of but two tons per acre will add to the wealth of this community alone each year more than the entire annual cost of all experiment station work.

## WHAT THE EXPERIMENT STATION IS DOING FOR THE LIVESTOCK, DAIRY, AND POULTRY INDUSTRIES.

The experimental work of the department of Animal Husbandry has been considerably altered by war conditions, which have presented two problems needing immediate solution, and which have made some older projects either impracticable or of less immediate importance. The use of wheat and oats, for example, was practically prohibited by war conditions, making it unnecessary and impractical to continue work with these feeds. On the other hand, there is an urgent demand for information on mill feed, potatoes, garbage, salvaged grains, oat hulls, peanut hulls, and other feeds that are ordinarily of little significance.

**Cost and Method of Raising Spring Lambs.** Data on how to produce spring lambs has been obtained for a period of several years. Owing to rapidly changing and abnormal prices, the investigation should be continued.

**Cost of Horse Power.** The object of this investigation is to determine the cost of one horse per hour under conditions where all items of feed, harness, and shoeing are charged.

**Pasture Yields.** This work was undertaken to determine the number of cattle, sheep, or horses that can be pastured on an acre of various types



of pasture. In the case of fattening and growing stock it was also to determine the number of pounds of gain obtained from different kinds of pastures. While much valuable data have been collected it is thought best to continue the investigation for some time yet before publishing the results.

**Short Feeding of Steers.** This work was undertaken to determine the possibility of finishing steers in less than the usual time by the use of lighter grains with chopped hay and silage. The test began with records kept on steers fed for class purposes, and the results obtained were so remarkable and the steers gained so rapidly and so economically that we continued the work to determine whether our results were accidental or due to the peculiar system of feeding. Three years' work has indicated the latter, but the work will be continued to avoid the possibility of error. So far, the work has been financially profitable even with high-priced feeds.

**The Feeding Value of Oat Hulls.** Large quantities of oat hulls were put on the market by Portland millers during 1917 and 1918. It has been found that these oat hulls can be used as a substitute for hay in the feeding of cattle and horses and that their value is approximately half way between oat straw and good hay. One ton of oat hulls supplemented with one hundred pounds of oil meal or cottonseed meal is approximately equivalent to one ton of good vetch hay.

**Salvaged Grain for Hogs.** Certain salvaged grains from the dock fires in Portland were used in this experiment. It was found that pigs would eat a full ration when composed of forty percent salvaged grain and sixty percent barley. A value of fifteen dollars a ton, sacked, was placed on the salvaged grain by the food administrator on our advice.

**Value of Garbage and Buttermilk.** This experiment was conducted to determine the relative value of garbage and buttermilk as supplements to grain.

The results of our experimental feeding have been of immense value during the war emergency. In peace times the relative values and availability of various feeds do not change much from time to time and farmers have learned largely by experience which are the cheapest and most desirable, but under war conditions the prices and availability of various feed stuffs changed so rapidly that farmers could not depend upon past experience to show the present relative values of the various feed stuffs. Our experiments enabled us to get specific data on such problems as the following: Straw for the wintering of cattle, both with and without supplement such as cottonseed meal and corn silage; the relative values of grain and hay both for wintering and fattening purposes; the percentage of improvement resulting from chopping hay for use in fattening cattle; the relative values of the various standard feeds for hogs such as barley, oats, mill feed, potatoes, corn silage, roots, kale, cocoanut meal, oat hulls, and oat-hull products, salvaged grains, etc. These results were tabulated in the form of brief charts showing the relative values of the various feeds for different kinds of livestock, such as hogs, sheep, and cattle. We were thus able to answer very definitely the many inquiries received.

**Poisonous Plants.** It is estimated that poisonous plants are costing the stockmen of Oregon about \$150,000 per annum. A preliminary survey has been made throughout the range section of Oregon beyond the Cascade Mountains to determine the prevailing species of plants likely to be poisonous to stock, their habitat, species of plants likely to be associated with them, the extent of poisoning occurring, and the most satisfactory means of avoiding poisonous plants or eradicating them. Among the interesting information secured was the definite establishment of the occurrence of loco poisoning in interior Oregon and the discovery of the species of plant, not hitherto reported from the State, which is responsible for this poisoning. The investigation has already shown the seriousness of the losses to the stock men from a relatively small number of poisonous plants and the great need for information on the part of stock raisers regarding the identity of the plants causing the trouble, the situations in which they may be expected to occur, and the means which should be taken to prevent poisoning. This work should by all means be continued and extended with the idea of working out a practical system of herd management which will eliminate, or at least minimize the losses.

**Abortion and Sterility in Cattle.** Abortion and sterility in cattle are estimated to cause a loss of more than one million dollars to the livestock and dairy industries of the State. Unknown diseases of horses and various other livestock diseases also are causing serious losses. Investigations of these diseases have been undertaken in a limited way, but results can hardly be expected until the investigations have been developed far beyond the limits which are possible with present funds.

Such results as have been obtained in controlling sterility and preventing the introduction of contagious abortion have been presented to the dairymen of Oregon, Washington, and British Columbia, through lectures and demonstrations at the meetings of the various dairy associations. Clinical material for the investigation of sterility has consisted principally of the high-producing cows of Oregon which are sterile. The results as a whole have been satisfactory. Many temporarily sterile cows have become pregnant after treatment. The results of the work of the Station on sterility have also been presented to the veterinarians of the Northwest at association meetings and through lectures and demonstrations at the Short Course for Veterinarians at Washington State College. Several veterinarians have indicated that they are following these methods with success.

**Walking Disease of Horses.** The work with reference to diseases of horses has not progressed sufficiently for any recommendations concerning their control.

**Hemorrhagic Septicemia** of sheep and cattle has probably existed in Oregon for twenty years or more. Definite diagnosis was not made until some four years ago. This Station was first to make such diagnosis in sheep and it assisted the State Veterinarian's office in diagnosing many outbreaks in cattle. Methods of control of this disease by vaccination had already been worked out by the United States Bureau of Animal Industry. Such methods have been successful in this State. Through the original diagnosis made here and by the State Veterinarian, the prevalence of the disease has been determined. Many thousand doses of the vaccine are now being sent out annually by the department of Bacteriology.

**Infectious Keratitis** of sheep has become epidemic in at least two vicinities in Oregon. Diagnoses have been made in the laboratory and methods of control as recommended by European investigators have been followed with success.

Some limited studies of **White Diarrhoea** of poultry have been made. Five thousand birds have been tested and reacting ones have been eliminated. This has resulted in practically eradicating this disease in several of the best flocks of the State.

**The Use of Pepsin as a Substitute for Rennet in Cheese Making.** The cheese industry is one of the most important agricultural industries of Oregon. At the outbreak of the war in 1914 or shortly afterwards, the restrictions placed upon commerce cut short the importation of rennet stock. The shortage suddenly became acute. Cheese makers had difficulty in obtaining rennet which had been absolutely necessary as a coagulant in the manufacture of cheese. Pepsin had been used experimentally only and then rather superficially as a substitute. Cheese makers began writing to the Experiment Station for information on the use of pepsin. Fortunately, we were, at the time, operating a cheese-factory laboratory, and began immediately investigating the use of pepsin as a substitute for rennet. Within two weeks' time it was possible to publish a preliminary report indicating how pepsin could be satisfactorily used. This report attracted a great deal of attention among cheese makers. As a result the cheese makers with confidence took up the use of pepsin and the Experiment Station rendered a real emergency service. Since that time, the work on the use of pepsin has been continued and the results are published in detail in Bulletin 155 entitled "The Use of Pepsin as a Rennet Substitute in Cheddar Cheese Making."

**The Neutralization of Cream and Its Relation to the Finished Product.** Investigations have been under way for some time to determine the comparative quality of butter made from sour cream, and butter made from the same cream by having its acidity reduced with one of the neutralizing solutions which are now in quite common use. The importance of this investigation is apparent when it is realized that a very large amount of cream is delivered to our creameries in a sour condition. It is claimed by many manufacturers that if the acidity in this cream is reduced butter of much better quality can be made. Butter made from high-acid cream does not have a high-keeping quality. It is not practicable, however, to pasteurize high-acid cream, as the combination of casein enclosing a large quantity of fat is lost in the buttermilk. As the practice of neutralization is quite common and the information on quality of the resultant product is very limited, it is advisable that some definite data be published which bear directly on the effect of neutralization of cream on the quality of butter. It will be necessary to continue the work for some time before definite results can be announced.

**The Minimum Quantity of Butter Fat Necessary to Produce Normal Development of a Young Growing Dairy Animal.** It is important at all times and especially so during the present period of high prices for dairy products that farmers should know the minimum quantity of butter fat necessary to produce normal growth in dairy calves, during the milk feeding period and especially at the time when the young animal is changed from whole milk to skimmed milk. A feeding experiment has



been undertaken to determine this point, and to determine the effects of a supposedly insufficient quantity of butter fat in the ration. While this experiment is well under way the results are not as yet ready for publication.

**Vetch as a Dairy Ration.** Throughout this State, at least, vetch forms an important crop. It is often used, together with oats, both as a dry roughage and as an ensilage. It is very desirable to know the effects of the vetch plant on the health and vigor of a growing animal and later on a producing animal. An attempt is being made by maintaining an animal on the vetch plant alone and thus magnifying its desirable or undesirable qualities to determine quickly its effects on the growth, health, and reproduction of a dairy heifer.

**To Determine the Effect of the Protein Intake on Growth, Reproduction, and Milk Production of Dairy Animals.** It is important to know just how wide or how narrow a ration can be and yet yield satisfactory results. In this part of the country the difficulty appears to be that the ration is too narrow. It is important to know if, first, the narrow ration affects in any way the growth production or reproduction of the animal, and, second, whether the widening of the ration by the addition of high-priced carbonaceous feeds would be economical.

**To Compare Several Roughages and Concentrates in Their Ability to Produce Milk.** The question of what to feed is one that requires much attention. Dairy men must know what is the best feed under various existing conditions. Any project which has as its aim the solution of this problem should receive immediate and conscientious attention.

**To Determine to What Extent in Feeding Dairy Cows Roughages May be Substituted for Grain.** A problem which has received but little attention in some states and practically no attention here, is one that has to do with the reduction of the quantity of high-priced concentrates fed to dairy cattle. To what extent is it possible to make the home-grown roughages, such as oats and vetch, clover hay, or any other legume, ensilage, etc., replace the concentrates? To what extent will the milk yield be reduced? What is the dividing line of profit and loss in this reduction? Experimental feeding tests to determine these points are under way.

**Feeding Experiment with Mill Run and Barley.** Food Administration regulations, and primarily the shipping conditions, have created a shortage of mill feed in the Pacific Northwest during the past year. This shortage was not foreseen until late in the summer. Dairy men have used as a concentrated feed the various mill feeds, to a very large extent. It has been impossible for them to secure sufficient mill feed during the last year. Furthermore, neither bran nor shorts has been manufactured, but the two materials have been mixed and are sold in the form of mill run. While the feeding value can be calculated, the actual practical feeding value and the process of using this feed in the ration had not been determined. As soon as this emergency was recognized, the Experiment Station began feeding experiments to ascertain the value of mill run in the concentrated ration of the dairy cow. Experiments were also conducted regarding the use of barley as a feed for dairy cows. Large numbers of dairy men do not recognize the fact that barley, together with certain concentrated feeds of high protein content, can be satisfactorily used as a substitute



for mill feed. This problem is being worked out by the Experiment Station, and while complete results will not be available for some time, a preliminary report will be made within the next month that will be of value.

**Wintering Heifers on Cheap Rations.** The feasibility of wintering dairy heifers on cheap rations, particularly straw, a little mill run and cottonseed meal, is being investigated. This ration is being fed to take the place of high-priced clover or alfalfa hay. Many farmers are interested in this experiment and many inquiries are received as to the success attained.

**Poultry Investigations.** The main line of poultry investigations during the past nine years has been breeding for increased egg production. The results of these experiments have been generally acknowledged as highly important. Starting with a flock of Barred Plymouth Rocks that averaged less than one hundred eggs, for each hen a year, in five years we had raised the average to about 135 eggs and the present year, under similar conditions and equal-sized lots, we have secured an average of better than two hundred eggs for each fowl for this breed. With a flock of White Leghorns as foundation stock, averaging one hundred and six eggs for each hen we have increased the yield until the average exceeds two hundred under similar conditions. By crossing these two breeds we have developed a variety called Oregons, that have shown very high fecundity. We secured from this variety the first hen in the world that made a record of over three hundred eggs in a year by trap-nest. Since then we have had several other hens of the same strain exceed three hundred. A pen of ten has averaged two hundred and fifty eggs a year, and many larger pens or yards have averaged over two hundred. The selection has covered not only the first year's production, but the productive life of the hen. We have reared a number of hens that have laid more than one thousand eggs. We had the first actual trap-nest record of a hen laying one thousand eggs in a life time. This opened up the possibility not only of increasing the first year's production of the hen, but adding to the period of possible production.

To demonstrate whether our results were due to some local condition our stock has been tested under various conditions of climate and management. At the Panama Pacific Exposition at San Francisco, we entered three pens of fowls, one of Barred Rocks, one of White Leghorns and one of Oregons in an International Egg-Laying Contest. In a year's contest these pens won first, second, and third places respectively. In the following year at the Missouri contest a pen of five Oregons won second place with one hundred competitors, the Oregons averaging two hundred and thirty-two eggs for each hen. In the same year at the International Contest at Storrs, Connecticut, a pen of ten Oregons won third place with one hundred competitors, the Oregons averaging two hundred and twelve eggs a hen. During the past year at the Storrs Contest, with one hundred competitors, a pen of Oregons won first place with a record of two hundred and thirty-five and two-tenths eggs for each hen. This is the highest record for a pen of ten hens in any contest. At the British Columbia Contest this year, a pen of Barred Plymouth Rocks made a record, considerably in excess of any other breed or pen there, the record being two hundred eggs for each hen in eleven months. At the All-Northwest Contest at Pullman, Washington, a pen of our Barred Rocks has

been first for several months and although the report has not yet been received the record will probably exceed two hundred and forty eggs for each hen for a pen of five hens. Last year the pen that won at the Pullman Contest was the College strain of Leghorns.

Each year there has been a greater demand for this stock, and it is impossible to supply all orders. We have sent out some ten thousand settings of eggs, or one hundred thirty thousand eggs and some three thousand breeding males all with pedigrees showing the egg production of female ancestors for several generations back and all having records the first year of approximately 200 eggs for each hen. The poultrymen receiving this stock have later acted as distributing agents, so that the strain has had extensive distribution in this State as well as in most other states and in foreign countries. As a direct result of this distribution of eggs and males, the increase in production will approximate in value, \$250,000 annually, to say nothing of the stimulating effect in years to come or of the further and larger incentive which these encouraging results have given to poultry breeding and to poultry breeders everywhere.

**Incubation Experiments.** Probably the most difficult part of the poultry business is to hatch and raise the new stock. Losses in incubation and brooding are enormous, the country over. Our experiments, which have had to do mainly with artificial incubation, have shown that the ventilation and the humidity conditions in the incubator are important. When the investigation is completed, it will be possible to give definite information in regard to methods of incubation which should result in a great saving.

#### WHAT THE EXPERIMENT STATION IS DOING FOR THE HORTICULTURAL INDUSTRY. (CROP PEST AND HORTICULTURAL INVESTIGATIONS.)

**Insecticide Investigations.** Recent insecticide investigations have been largely centered around a study of possible aid in causing poison sprays to stay in suspension longer, spread more easily, and stick better; and in a study of the chemical, physical, and caustic properties of commercial calcium arsenate. Laboratory tests were supplemented with field trials in a large commercial apple orchard. The results indicate that there is great promise in the use of a spreader added to arsenate sprays for codling-moth control.

**A Study of the Economic Slugs of Oregon.** An exhaustive study of the life-history, habits, and methods of control of this destructive pest has been nearly completed and the results soon will be ready for publication in bulletin form.

**Pruning Investigations.** Studies are being made of the effect of winter or dormant pruning, summer or active pruning and various combinations. Some of the results have been reported upon. It has been found that certain types of summer pruning are proving devitalizing to the trees, particularly in those cases where the greater amount of leaf materials formed by the growth of any particular year is removed during the summer. This is to be expected because of the lessened carbohydrate supply. As previously shown, the early or June heading shows in all varieties

a greater proportion of fruit buds and leaf spurs with little or no decrease in the vitality of the tree itself. It seems desirable to consider this investigation as a study in regeneration, (the question being to determine what internal factors regulate a reproductive regeneration) and what a vegetative one. The results from certain phases of the pruning investigations were reported in Bulletin 146.

**Strawberry Breeding.** Strawberry breeding experiments have continued during the biennium. A number of selections have been produced, several of which give promise of being valuable new varieties. Additional seedlings are coming into bearing each year.

**Apple Breeding.** Apple breeding investigations have continued through a number of years, and have resulted thus far only in the production of a small number of apple seedlings of known parentage, which have produced fruit. Valuable notes are being taken, however, upon their vegetative character, and as they come into bearing data will have accumulated that will be of real value. This data should afford information on methods of inheritance in the apple.

**Cherry Breeding.** The work in cherry breeding is making normal progress. Approximately two hundred cherry seedlings have produced fruit. Records have been made on their vegetative and fruit characters and it is believed that among the two hundred are some that are of real merit. A number of additional seedlings of known parentage are expected to produce fruit each year.

In connection with the cherry-breeding work it is proper to mention the cherry-pollination work, which may be regarded as a by-product of the cherry-breeding investigation. It is worthy of note that practically the entire cherry-orchard area in the vicinity of The Dalles has been provided with proper varieties for cross pollination as a result of our investigations.

**Nut-Variety Trials.** A number of additional varieties have been added to our nut-variety collection during the biennium, mainly through the courtesy of the Office of Foreign Seed and Plant Production, United States Bureau of Plant Industry. Careful records have been made from time to time regarding the vegetative characteristics of different varieties. The work with filberts and walnuts is found to be of particular interest and value to the nut industry of the State. Experiments in walnut pollination have been undertaken at the request of the Western Walnut Growers' Association.

**Depth of Planting Investigation.** Various varieties of apples, prunes, etc., have been planted at various depths ranging from two inches shallower than in the nursery row to thirty inches deeper. The trees are being measured annually to determine their terminal growth and also their increase in diameter. In a general way the indications are that the shallower the trees are planted the better. On good soils there is little difference noted, but on soils having a heavy subsoil the trees should be planted shallow.

**Pear Harvesting and Storage Investigation.** This work deals with attempts to determine the best time for harvesting the leading varieties of pears, and the best methods of storing. Fruit was picked at intervals



of three or four days throughout the entire season, and stored under ventilation, ear temperatures, and cold storage. In general it was found that the fruit was being picked from one to two weeks too early, and that early picking gives a poor and astringent fruit, which keeps quite well without cold storage; but that the third and fourth pickings are greatly superior in quality, size, and keeping quality, being superior not only to the earlier picked but also to those picked very late. The results and conclusions obtained are to be found in Station Bulletin 154, entitled "Preliminary Report of Pear Harvesting and Storage Investigations in Rogue River Valley."

**Onion Fertilizer Trials.** Trial Cooperative fertilizer tests designed to test the relative efficiency of various fertilizers for onions on beaverdam land, which have been conducted since 1913, show that super phosphate in amounts varying from 400 to 1200 pounds per acre can be profitably used. In the year 1917-18 four hundred pounds of super phosphate showed an average net gain of \$24.20. Eight hundred pounds of this material showed an average net gain of \$41.60 while twelve hundred pounds of super phosphate gave a net gain of \$63.00. These estimates were based on onions selling for \$2.00 per cential and fertilizer at \$25.00 per ton.

**Broccoli Investigations.** Broccoli seed from four different sources tested on the grounds of the Experiment Station show a wide variation in trueness of type and productivity. Imported seed showed an average of 75 percent plants that were true to type, 25 percent producing unmarketable heads, seed locally produced in Oregon produced 86 percent true to type and 14 percent unmarketable. Two strains from a Portland seed house show a wide variation, one being practically a duplicate of the locally grown strain, while the other strain produced but 10 percent to 12 percent marketable heads. Experiments with fertilizer for broccoli in the Umpqua Valley indicate that inferior soil can not be brought to such a state of fertility by the use of commercial fertilizers alone as to make it capable of producing broccoli equal to that of naturally more fertile soils. Plots that have been manured have given most satisfactory results both in yield and trueness to type, there being a tendency for plants to overcome the poor types on land that is well supplied with organic matter. Irrigation experiments with tomatoes have shown that the use of water will prevent to a large extent the blossom end rot of that crop. They have also demonstrated the great value of irrigation in the production of late beans and in fact nearly all vegetable crops which have been tested in the Willamette Valley.

**Fruit Products Experiments.** Experiments have demonstrated the relative merits of non-dipping, dipping in cold water, boiling water, and hot lye water, in prune drying. These experiments have also demonstrated the usefulness of a self-recording thermometer in this work. Some tests in blanching and dipping in brine for beans and corn for evaporation and canning have been demonstrated and the relative canning value of some varieties of tomatoes and apples has been determined. A study has been made of Swiss chard as a canned product, first from the point of view of strains and types, and second, from the point of view of all leaf or all stem or a combination of both.

**Orchard Fertility Experiments.** Experiments with the use of nitrate of soda as an orchard fertilizer and with cover crops, in the Hood River



and Rogue River valleys have given remarkable results, and tend to revolutionize orchard practices in the Hood River Valley. The yield has been greatly increased and the vigor of the trees has been restored. The results of these experiments have led to further investigations, which show that in plants in general there is a mathematical relation between the nitrate and carbohydrate contents and that to produce certain desired results this factor must be considered. The results of this fundamental investigation have been published as Bulletin 149, "Vegetation and Reproduction with Special Reference to the Tomato."

**Peach-Leaf Curl Experiments.** This investigation has been conducted by means of spraying tests on the College farm and by the accumulation of data relative to the control of the disease from the different orchards of the State. One fact stands out preeminently; namely, the superiority of Bordeaux mixture both as regards reliability and effectiveness. Spraying may be successfully carried on with this material at practically any time during the winter, provided it is put on previous to the time when the winter buds begin to expand. Other materials tested at Corvallis, include lime-sulfur, Sherwin-Williams dry lime-sulfur, and Scalecide. Some degree of control was obtained with each of these but by no means equal to that with Bordeaux. In the data accumulated from commercial orchards through the State we find records of strikingly successful results from the use of both Bordeaux and lime-sulfur, provided the applications have been made sufficiently early, and earlier experiments at Corvallis have shown results from lime-sulfur nearly equal to Bordeaux. It is noticeable, however, that occasional instances of failure to get satisfactory control with lime-sulfur have occurred throughout the State, where such failures cannot be attributed to too great delay in application or to lack of thoroughness. It is evident that lime-sulfur, for some reasons, under certain circumstances may prove unreliable, although it is usually effective.

**Control of Gooseberry and Currant Diseases.** We have found that a very effective control can be secured by spraying with lime-sulfur, and with Sherwin-Williams dry lime-sulfur. Sulfur dust, and lead-arsenate combination also have good results. Iron-sulphide mixture, which is often recommended, was far less efficient than any of the other materials used. The spraying applications which gave the most successful results were as follows: The first, just as the leaf structures began to unfold and before any of the leaves were full sized; the second, just before blooming.

**Powdery Mildew of the Apple.** In experimental spraying for this disease conclusive results were not obtained but the indications are that the sulfur dust application given for the control of the scab and codling moth give better results than lime-sulfur alone, iron sulphide mixture alone, or iron sulphide mixture and lime-sulfur combined, and the conclusion also seems to be justified that the regular scab spray applied thoroughly will keep the mildew down to a point where it will not be regarded as serious.

**Brown Rot.** Experimental spraying for brown rot was undertaken at Corvallis, Looking Glass, Salem, Newberg, and Dallas; but on account of the absence of weather favorable to the development of ordinary fruit rot on uninjured fruit there was practically no brown rot in the orchards where the tests were carried on except in the case of cracked fruit. The result was therefore negative.

**Walnut Blight.** On account of the seriousness of this disease and its importance to the rapidly growing walnut industry, experimental efforts have been made to control the disease by spraying. The results, while not conclusive, are distinctly encouraging and lead to the belief that future tests may show the feasibility of controlling this disease by spraying.

**Apple and Pear Scab.** Experimental spraying for apple and pear scab was conducted at Hood River, Salem, Corvallis, Estacada, Fargo, and Wilbur. The main purpose of the work was to test the comparative efficiency of dust spraying with the method of control by the use of lime-sulfur sprays. The results obtained with dusting sulfur showed this material to be nearly if not quite as effective as the usual liquid lime-sulfur. The cost of the dust in the quantity in which it was applied in these tests was very much greater than the cost of the liquid spray, though the time saved was considerable. The most valuable result of the season's work was the striking evidence of the accumulated effects of good spraying.

**Bean Diseases.** With the development of the bean-growing industry in the State during the past two years the condition of the crop has attracted more attention than usual. This has resulted in the discovery of several diseases not hitherto recorded from this State. The most important of these are bean blight, which in several widely separated sections of the State destroyed from thirty-five to forty percent of the crop or more on isolated fields; and bean mosaic, which is reported as a serious disease in the East. Comparatively little work has been done on these diseases as yet.

#### WHAT THE EXPERIMENT STATION IS DOING TO ASSIST IN DEVELOPING THE SOIL RESOURCES OF THE STATE.

Soil is the basis of all agriculture and the maintenance of soil fertility is fundamental to the permanent prosperity of a state. The soil investigations of the Experiment Station center around the proper feeding and watering of plants and the management of the soil to increase and maintain its productiveness. They include:

1. Fertility rotations for the Willamette Valley, the coast region, the dry land region, and the irrigated regions of the State.
2. Fertilizer experiments and cooperative demonstration experiments with the leading soil types of the State.
3. Soil acidity tests and lime trials.
4. Cooperative soil surveys.
5. Soil correction trials with "white land" and "black sticky."
6. Toxicity of alkali and of acid soils to crops.
7. Cooperative tillage and soil-mixture studies.
8. Feasibility surveys for irrigation projects and for drainage projects.
9. Cooperative duty of water and related investigations, including water variation trials, field water capacity studies, studies of root systems water tables, movements of moisture and irrigation water, cost of production under irrigation, water cost under field conditions and with tanks,

irrigation requirements under humid conditions, effect of manure rotation and fertilizer on irrigation requirement, costs of irrigation, effect of irrigation on organic content and its relation to bacterial activity, and nitrification.

10. Experiments on the distribution of water and improvements of irrigation practice.

11. Drainage and improvement of wet soils, including white lands, tide and overflowed lands, irrigated alkali and water-logged lands, and lysimeter and percolation studies.

12. Evaporation and weather studies in relation to soil production.

13. Improvement of water laws.

14. Variations in the wilting point for different crops and other critical moisture points for irrigated soils.

**Cooperative Tillage and Soil-Moisture Studies.** The object of this work is to determine advanced methods of cultivation for moisture conservation under the dry farming, irrigation farming, and rainfall farming sections of the State. Elaborate tillage experiments are carried on at Moro and Burns that show clearly the importance of early spring plowing and clean summer fallow. Soil moisture determinations are being extended to measure the effectiveness of these treatments and to test out under different conditions comparative effectiveness of cutting of weed growth at the surface as compared with the ordinary system of mulching, for conserving and producing the most profitable yields. The movement and distribution of moisture in dry land and under irrigation is a phase of this work.

**Survey and Feasibility of (a) Drainage or (b) Irrigation Projects.** The purpose of this project is to give assistance as need arises in shaping out and determining the feasibility of reclamation projects for drainage or for irrigation. It is planned to carry on this project cooperatively with the Irrigation Investigations Branch of the Bureau of Public Roads in the future. On these irrigation projects estimates have been made of the probable duty of water on various soil types and the feasibility of irrigation from an agricultural standpoint. Recommendations have been made as to the best methods of distributing water, types of agriculture best suited, and probable value of irrigation. The projects which have been given assistance during the past year total nine and cover an area of 147,500 acres.

The preliminary drainage surveys have been made largely in cooperation with the irrigation engineer of the College, or the project engineer in certain projects, to determine the feasibility from an agricultural and engineering standpoint. During the past year perhaps two dozen districts or communities have been examined and nine of these will require district organization. These nine projects contain an area of 153,100 acres.

In cooperation with the Extension Service, field drainage systems have been designed for sixty farms, aggregating over half a million feet of tile and serving 5,650 acres. One hundred and ninety thousand feet of this, or about two-fifths, was surveyed and profiles provided farmers.

The average value of the 153,100 acres examined for outlet systems would perhaps run \$50 an acre in its present undrained condition, while drainage would increase its productive value to something like \$100 an



acre. The amount of field drainage designed and surveyed showed an increase over twice the amount designed and surveyed the previous year, while the Grande Ronde drainage district is one of the largest districts in the State. Altogether, drainage activities have about doubled during the past year.

**Cooperative Duty of Water and Related Investigations.** The purpose of this project is to determine a reasonable and economic duty of water for the irrigated valleys in Oregon. This season is the fourth year of the investigation, which is carried in cooperation with Dr. Briggs of the Bureau of Plant Industry. The plan followed is similar to that employed the past year, some additional studies have been correlated with this general problem. Preliminary results for two years' work were reported in Oregon Station Bulletin No. 140. Additional soil tanks were provided at Corvallis the beginning of the present season and are being employed to determine whether the wilting point varies with different crops in the same soil.

The results already at hand and further data being secured will be of great value in determining a reasonable duty of water for the various irrigated valleys in the State. Special attention is given to the water requirement, extent, composition, and improvement of wild meadows. Weather conditions over the State in 1917 were a little drier and warmer than normal, and evaporation was a little above average.

The work has been carried out under field conditions largely, applying different amounts of water. Chief crops and important soil areas are employed and weather conditions noted in order to correlate the work. Results are reduced to an acre basis and expressed in terms of largest yield per unit water and maximum yield per unit land, the net profit an acre; and an acre is determined or considered in judging results. The total water requirement is also determined in most cases either under field conditions or more accurately by the use of duplicate tank trials.

One of the greatest wastes encountered has been that of over-irrigation in proportion to the capacity of the soil to retain water in one application. Field water capacity studies with cylinders, and, more recently, with lysimeters, have been made to learn the usable water capacity of the different irrigable soils. A quantitative study of root systems has been added to help in arriving more accurately at the total water capacity for the feeding root zone. Water-table studies are conducted in connection with this work and particularly in alkaline or moist regions, and a great number of soil-moisture determinations are made so that much is learned regarding movement and distribution of irrigation water in different soils.

Irrigation requirements under sub-humid conditions in Western Oregon are being conducted with field crops and the old duplicate plots have been employed for cooperative trials with vegetables. The effect of manure, rotation, and fertilizer on irrigation requirements is being studied in most of the trials with exact control of conditions on the Corvallis plots. Two complete rotations of four years each have been finished so that definite results are shown on these plots. Rotation and manure have built up the available fertility and water capacity, greatly benefiting the yields and reducing irrigation requirement in these experiments, the difference running about twenty-five percent. Proper irrigation has increased the



bacterial activity—counts having been made the past three years by the department of Bacteriology. In working out the water costs of dry matter, the composition and ratio of plant parts as affected by different amounts of water have been considered and improvement in the method of distribution of water on coarse soils has been used to reduce the quantity of water applied to such land. A greater diversity of crops has been employed in reducing the amount of irrigation required. Barnyard manure, sulfur, lime, and landplaster have also been very effectively used in this way.

Water cost of wild grasses in representative trials range from 1,000 pounds upward, while the water cost of alsike and timothy ranges around 600 pounds to each pound of dry matter. The total yield of the alsike and timothy or field peas runs about twice as much as the wild hay. This production is secured with less than half the water ordinarily used on wild meadows. Two diked areas of peat lands in Klamath Basin, formerly tule lands, were drained of  $3\frac{1}{2}$  inches depth an acre storm water at the beginning of the growing season. Later, about six acre inches an acre were applied last season as supplementary irrigation. The average yield of the tame grasses was about three tons an acre, chiefly alsike and timothy. An appreciable amount of alkali was pumped off in these drainage and irrigation trials, the total solids amounting to 266 pounds an acre, being the net amount removed. Fairly definite methods of improving the wild meadow and alkali lands have been developed. In the reclamation on the peat, drainage is the first step, while on the wild silt meadow better control of the irrigation water is of first importance. The average of all our trials indicates a general field duty of 12 to 17 inches of these lands. With better control of the water, use of tame grasses and legumes, it is believed that it will be possible practically to double the production of about half a million acres of these marsh and wild meadow lands in the State.

**Experiments in the Distribution of Water and Improvement of Irrigation Practice.** This work is being grouped into a project for the purpose of correlating studies that are being made to secure a most economically efficient distribution of irrigation water on the farm. The project is planned to be carried on in cooperation with Dr. Fortier of the Department of Agriculture. The strip-border method of distributing irrigation water could be used more largely on the gently sloping valley soils of the State, with the more porous soils. The length of run and width of strip or the length of furrow in furrow irrigation are questions which are constantly under observation in our work. The efficiency and durability of different kinds of materials for distributaries will be given further consideration in these studies. Wood flume, concrete, and wood pipe, metal flume, a slip joint and canvas pipes are under observation.

**Drainage and Improvement of Wet Soils.** The object of this project is to determine the most efficient methods of draining wet land areas of the State. The general plan is to install and study an operation of drains placed at different distances apart and at different depths. Studies of the water table and outflow from these drains are made and after-treatment given to facilitate the entrance of water into the tile. The wet areas under study include four classes of land; namely, white land, seeped

hill land of Western Oregon, tide and overflow land in the lower Columbia and coast region, and the irrigated alkali and water-logged land needing drainage in Eastern Oregon.

Studies of the water table and outflow on white land areas of the College farm have been continued the past year. From these investigations, a fairly definite idea has been formed as to the proper depth, distance apart, and size of tile in white land in the western part of the State. The standard arrived at for typical land of this character is tile laterals four rods apart and three feet deep with capacity of main drain sufficient to remove one-half acre inch an acre from the wet area every twenty-four hours. Since drainage is rather expensive and improvement of white land is rather slow, it is necessary to locate drains and handle the land after drainage, so as to loosen up the soil and facilitate the entrance of moisture into the tile in order to make the drainage enterprise most profitable and successful. Lime, clover, manure, green manure, and combinations of these were employed in these trials to facilitate tile in their operation. On one area of white land drains are installed to study the relative value of gravel as against straw for bedding over tile lines, to assist water in entering these drains in sticky soil. Results thus far are in favor of the straw bedding as being most desirable and far cheaper. It has been thoroughly established that white land can be successfully tiled and there is a great increase in the use of tile for such land. Providing outlet ditches on the district plan will greatly stimulate tiling of individual fields.

There are nearly 100,000 acres of tide land along the Oregon Coast and lower Columbia River. There are perhaps 75,000 acres of overflow land along the Columbia River and other streams in Western Oregon. Protecting levees and outlet ditches are provided for perhaps two-fifths of this area. Very few field drains and almost no tile are to be found in these lands. It is believed that the present productive value of the tide lands with excess water controlled is sufficient to justify extensive under-drainage development in this region. An experimental drainage system has been designed and is partly installed on the Branch Experiment Station at Astoria. The system is designed largely along practical lines but has an experimental section with guarded laterals at different depths and different distances apart. The outflow from these guarded laterals was measured during the past winter season. These plots are being cropped to field peas and oats which promise to give a very heavy yield, in place of the growth of marsh grasses and water-loving plants which formerly afforded poor pasture.

Studies have been made of the water table and subsoil conditions and their relation to the concentration of alkali on the surface over several affected areas in the irrigated sections of Oregon. The lands needing drainage there include (1) those that are alkaline in a virgin condition; (2) those that are water-logged or marsh land in a virgin condition; and, (3) those that have become water-logged and more or less alkaline as a result of irrigation. The relation of irrigation to the water table and the outflow of underdrains have been observed. The amount of alkali discharged from definite areas where measured quantities of water were applied has been observed, and the rate of reclamation studied. Considerable data have been accumulated and partly reported in Bulletin 137 and Bulletin 140 of the Oregon Experiment Station.

Another class of wet land that has been given some consideration is the seeped hill land of Western Oregon. A considerable part of the drainage surveys have been made in such land, with a view to intercept and control seepage or protect the land against erosion. To what extent this drainage will serve as a corrective for acidity should justify a quantitative study.

Eight lysimeter or percolation tanks are being provided and will give more exact control of conditions for studying the percolation of the drainage water in the wet seasons. These tanks can also be used in connection with irrigation studies in the summer season. It is contemplated that different cover crops and lime will be used on these lysimeters on wet soils and their effect on the outflow and composition of drainage water will be studied by analysis of the percolate. It is planned to correlate this work to some extent with the excellent work being done at the Hermiston Station by Mr. H. K. Dean.

Altogether, there is an area of something like 3,000,000 acres of wet land in Oregon in need of improvement by draining. This is an area half as large as the total area of the improved farms at the last census. These lands are generally located within easy reach of markets, are located where there is a long growing season and are generally rich alluvial soils. The reclamation of large areas of this land is one of the quick, permanent means of increasing food production. The survey and experimental work on the lower Columbia and in the marsh region of Central Oregon should lead to reclamation of some of the largest areas of good but comparatively undeveloped land in the State.

**Soil Survey.** General soil surveys have been made by the Experiment Station of reclamation projects embracing over two million acres. In cooperation with the U. S. Bureau of Soils, a detailed soil survey has been made of Yamhill county and Washington county.

These surveys determine the location, extent, and composition of each soil type, which is mapped on a scale of one inch to the mile so that the character of soil on each farm is shown. These maps are of great value to prospective settlers and for advising farmers as to management of their soils. Also, the work forms a basis for fertility experiments calculated to develop a permanent system of agriculture.

**Crop Rotation and Soil Fertility Experiments.** Fairly complete fertilizer and rotation trials are under way on a dozen definite soil types in the State. Three dozen or more simple tests are conducted in addition in cooperation with the Extension Service, through County Agents. The trials are now from one to ten years' duration.

The value of liming for most of the acid soils of Western Oregon has been developed through these investigations. Depletion of nitrogen and organic matter, and the need of clover and legumes on most of the old grain lands, particularly in Western and Southern Oregon, is also becoming more and more evident.

Crop rotation and manure with legumes under irrigation have been found promptly to build up the water capacity and the organic contents where water can be secured. Some soils in the marshes of Deschutes Valley have responded to potash fertilizer, and repeated tests indicate that the red hill soils respond to applications of super phosphate.



**Chemical Studies of Oregon Soils and Fertilizers.** The sulfur content of Oregon soils has been studied in cooperation with the Southern Oregon Branch Experiment Station. The work has consisted chiefly in ascertaining the sulfur in sulfate form, as it exists in various soils treated and untreated with sulfur containing fertilizer. This particular phase of the work is still in progress but will soon be completed. A joint bulletin containing detailed accounts of the work accomplished is now being prepared for publication.

**Lime and Fertilizer Work.** In compliance with the State Fertilizer Law, about 50 samples of fertilizer, including simple and complete fertilizers, have been collected and analyzed. No violations of the requirements of the law have been detected.

As per requirement of the State Lime Law which was enacted by the twenty-ninth legislative assembly, about 30 samples of lime have been collected and analyzed. These samples include limestone, hydrated lime, and land plaster. The results of the analyses show that a large number of samples do not agree with the guaranteed composition. It has been shown, however, that these were not deliberate efforts to defraud, but were due to ignorance or misinterpretation of the law; and since this is the first year that the State Lime Law has been in effect it has been deemed advisable to notify manufacturers regarding the violation and suggest means of correcting irregularities.

#### FIELD-CROP INVESTIGATIONS.

**Cereal Investigations.** Varietal trials of cereals have demonstrated the highest yielding variety for each section of the State, clearing up many questions and resulting in greater production.

A cereal classification nursery, which has been started for the purpose of developing pure-line strains of leading wheat varieties and in which results have been obtained on nearly seven hundred selections, has given data for a better standardization of cereal varieties and has been useful in supplying information on which to classify wheat varieties under the new Federal and State Grain-Grading Regulation.

Laboratory tests of field-collected samples treated, while growing, with nitrate of soda as compared with untreated samples, has shown a superior quality of wheat when supplied during the growing period with a greater supply of nitrogen. Samples of wheat from legume soils or from soils treated with nitrate of soda are harder in texture and carry a higher gluten content than wheat grown on non-legume soils or untreated with nitrate.

Ear-to-row tests of corn have resulted in several very satisfactory strains of early- and medium-maturing Minnesota 13, which are being distributed in Western Oregon.

**Forage Crop Investigations.** A vetch-variety trial which extended over several years has shown the superiority of common vetch over all other varieties for hay and for cover crops under Willamette Valley conditions. Vetch cultural trials have indicated the superiority of moderate rates of seeding and from medium to early fall planting. Varietal and cultural trials with "horse beans," have shown that plant to be worthy of culture in the Willamette Valley. Of the miscellaneous legume trials,



annual white sweet clover shows much promise. Purple vetch and Tanger peas are worth extended culture as seed crops. Miscellaneous trials have shown Eureka clover to be unsatisfactory as a forage plant. Miscellaneous experiments include flax varietal and cultural trials furnishing information for the more extended culture of the flax crop in the State.

**Hay Experiments.** Hay experiments include curing methods, stacking, studies on relation of volume and weight, and studies on the moisture content and moisture movement in stored hay. Recommendations of the Station that hay be cut earlier, stored quickly, frequently with the use of side delivery rakes, and either stacked or put into storage promptly, are being more generally followed.

**Control of Grain Smut.** Results of the greatest importance have been obtained in connection with our studies on the seed treatment of cereals for control of smut. The commonly reported injury from formaldehyde has been found to result largely from improper handling subsequent to the treatment rather than to the treatment itself. Copper sulphate, although in quite general use, was found to be absolutely unsafe in this State for seed treatment, severe injury resulting even under the most careful handling. The great value of the lime bath in counteracting the copper sulphate injury was demonstrated.

**Potato Disease Investigation.** The work on potato diseases has revealed the great importance of the use of disease-free seed and the rotation of crops as the most valuable improvement in the present practices in potato growing leading to increased production. The results of these investigations which will have an important effect in reducing the enormous losses from potato diseases are being prepared as rapidly as possible for publication and investigations on storage decay in potatoes have also been undertaken.

#### WHAT THE BRANCH STATIONS ARE DOING.

With an area greater than the combined areas of New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey and Delaware, Oregon, owing to varied topography, soils and climate, presents a greater diversity in the factors which influence agricultural production than are to be found in all that portion of the United States east of the one hundredth meridian and north of the Ohio river; and the problems which press for solution are correspondingly varied and numerous.

To adapt the experimental work to these widely varying conditions, seven Branch Stations have been established in seven of the distinctive agricultural sections of the State. Some very valuable results are being obtained at these branch stations, only brief mention of which can be made here.

The John Jacob Astor Branch Experiment Station at Astoria was established primarily for the purpose of giving the Experiment Station opportunity to study the problems of tide-land agriculture. The principal lines of investigation so far undertaken are: 1 Forage crop investigations, 2 Soil fertility trials, 3 Root variety trials, 4 Rutabaga seed starting trials, 5 Potato variety trials, 6 Potato seed improvement work, 7 Drainage investigations, 8 Problems relating to feeding and management of dairy cattle under coast conditions.

While results have been obtained which have attracted considerable interest from the surrounding farmers, the work has not yet progressed to the point where definite statements can be made. As more land is cleared and subdued the investigations will be extended to cover other lines of tide-land agriculture.

Careful varietal tests with hundreds of varieties, over a period of six years at the Branch Experiment Station at Moro, have demonstrated that certain varieties of cereals produce from three to six bushels more per acre than the variety commonly grown by farmers of that section. These new and improved varieties have also demonstrated their superiority at the Branch Experiment Station at Burns. Seed from these varieties has been distributed, and the varieties are now so widely grown that abundant seed is available.

Six years' results in an elaborate series of tillage experiments at the Moro Station have shown that (1) yields of winter wheat are appreciably increased when plowing for summer fallow is done early in the spring or when thorough disking of the ground precedes plowing, if that operation is deferred; (2) that the growth of weeds on the summer fallowed ground reduces wheat yields; and (3) that certain commonly accepted dry farming practices such as packing the ground after plowing and the harrowing of winter wheat in the spring do not increase wheat yields. Farmers of the Columbia Basin as a rule have been quick to adopt the farm practices recommended by the Branch Station.

As a direct result of the investigations of the Southern Oregon Branch Experiment Station, irrigation is being more generally practiced, two irrigation districts having recently been formed; thousands of acres of alfalfa are now treated with fertilizer following the station's demonstration of the value of sulfur as an alfalfa fertilizer. As a result of this work, alfalfa is also being widely grown on adobe soils where it was before unprofitable. Marked experimental results in the use of nitrate of soda as an orchard fertilizer have been obtained. The new cover crops, which have recently been introduced by the station, will make it possible to maintain the nitrogen supply in orchards without resorting to artificial fertilizer. The discovery of a new and much more efficient disinfectant for fire blight work will result in a saving of pear trees and labor amounting to hundreds of thousands of dollars annually, while the work with blight-resistant varieties and species of pears promises to revolutionize the pear industry.

Extensive experiments at the Umatilla Branch Station with different methods of applying water to the soils of that section have resulted in demonstrating the economy in labor and water of the border system which is now being rapidly adopted. Experiments with many varieties of trees for wind brakes and of vegetables, small fruits, and grass pastures, have shown interesting results.

The work of the Hood River Station is devoted almost exclusively to problems of importance to the orchard industry. Extremely interesting and valuable results have been obtained and the Station has the very cordial support of the entire community.

All the livestock industry and all the farming of irrigated valleys of Eastern Oregon together form the field of the Eastern Oregon Branch Experiment Station at Union. These important interests cannot adequately

be dealt with by the home Station, owing to its location at Corvallis. Our only means of contact, therefore, is through the branch station at Union. This station has already been of immense value to the agricultural interests of Eastern Oregon through many investigations, some of which have been so valuable that any one of them has more than paid for the entire cost of the station.

Practically all of the hulless barley grown in Union and Wallowa counties are varieties produced at this station. In localities where other hulless varieties are grown in competition with the station varieties, the latter, since they are much heavier yielders, usually command a larger price on the market.

The variety of wheat which has given such good results on the dry-land farms of Eastern Oregon was introduced by the Eastern Oregon Branch Experiment Station. It is of interest to note that this variety was first to reach the two-dollar mark in Chicago. This variety is a bearded wheat; from it the station is now evolving a new variety without the beards but with practically all the desirable characteristics of the parent variety.

The hog raisers of Eastern Oregon have generally used wheat instead of barley, under the impression that the former was much better feed. The Experiment Station has demonstrated that barley gives even better results than wheat in pig feeding, and since throughout the vast areas of Eastern Oregon barley yields much more than wheat the results of these investigations reduce the cost of pork production by just that percentage.

Many farmers fatten their hogs in small dry lots instead of running them on pasture, under the belief that too much exercise will be detrimental to easy fattening. The Experiment Station has demonstrated that instead of hindering fattening, alfalfa pasture increases the gains, makes a better finished hog, and thus lessens the cost from ten percent to twenty-five percent.

The station has also demonstrated that the use of chopped alfalfa hay for fattening cattle would produce gains forty percent greater than with long hay.

This station not only develops and demonstrates new methods but is the source of our only available information along certain lines. Two years ago when potatoes were worthless, the Station provided exact information as to their value for pork production and just how to use them. As a result of feeding experiments which have been carried on for several years, this station has furnished the only accurate information available in the Northwest on the cost and gains of fattening cattle on hay alone and on hay and grain, the amount of feed that can be produced on alfalfa and blue grass pastures, on the value of cut hay for fattening cattle, on the exact money value of shelter in fattening hogs, and the money value of all the different grains, tankage, alfalfa hay, alfalfa meal, cut alfalfa, field peas, and many other feeds for growing and fattening hogs.

While the positive results are the more striking and the more interesting, the negative results are none the less useful. Scores of very common farm practices have been thoroughly tried out at the station and found to be entirely wrong. Yet so firmly rooted have been many of these practices that tests have had to be repeated again and again to



drive home the necessity of a change of method. A fair example is the common practice of feeding hogs grain alone without supplement.

All of the work done is small in comparison with that now in progress, and the cessation or the curtailment of this work at the present time will not only render idle one hundred thousand dollars of equipment but will make worthless a great number of experiments now partly completed, accurate results from which can only be obtained, in most cases, by continuing the work through several years. For example, a number of new varieties of grain are about ready for distribution. To abandon the work now would be to lose all of the progress that has been made. There are also under way extensive tests with different methods of growing cattle. The final results of this test cannot be obtained until 1920 and closing the tests before that time would mean the complete loss of the work so far done.

#### BULLETINS ISSUED DURING THE BIENNIUM.

##### Bulletin

##### No.

- 140—The Economical Use of Irrigation Water.
- 141—Report of the Hood River Branch Experiment Station.
- 142—The Culture of Small Fruits on Irrigated Sandy Land.
- 143—New Facts Regarding the Apple Scab Fungus.
- 144—Dry Farming Investigations at The Sherman County Branch Experiment Station.
- 145—The Evaporation of Prunes.
- 146—Pruning Investigations. Second Report.
- 147—Bark Beetles Infesting the Douglas Fir.
- 148—The Life-History and Control of the Rose-Leaf Hopper as an Apple Pest.
- 149—Vegetation and Reproduction with Special Reference to the Tomato.
- 150—Dry Farming Investigations at the Harney Branch Station.
- 151—A Chemical Examination of the Loganberry.
- 152—The Western Newt or Water Dog.
- 153—The Life-History and Control of the Pocket Gopher in the Willamette Valley.
- 154—Preliminary Report of Pear Harvesting and Storage Investigations in Rogue River Valley.
- 155—The Use of Pepsin as a Rennet Substitute in Cheddar Cheesemaking.

Respectfully submitted,

A. B. CORDLEY, Director.



## REPORT OF THE EXTENSION SERVICE.

To the President of the College,

Sir: Pursuant to the provisions of the Act of Congress providing for cooperative extension work, I have the honor to submit herewith a report of the activities of the Extension Service of the Oregon Agricultural College from July 1, 1916, to July 1, 1918, together with a brief recommendation for future development.

### ORGANIZATION.

The Extension Service of the College was authorized by the Regents in 1911. The State Extension Act permitted the organization of the Service in 1913. The initiation of the present type of organization for Extension work was effected in 1914, upon the signing of the General Memorandum of Understanding with the States Relation Service of the United States Department of Agriculture. This cooperative agreement is possible through the terms of the Cooperative Extension Act of May 8, 1914, (Smith-Lever Act).

The Extension Service of the Oregon Agricultural College is charged with the duty of extending the instruction, information, and assistance of the College of Agriculture and Experiment Stations, and of the United States Department of Agriculture, to every portion of Oregon, and to all persons who are not in a position to undertake resident work. By the terms of the Cooperative Extension Act, emphasis is laid on agriculture and home economics, although any measures that may enrich the industrial or rural life of the State are given special attention and assistance.

All work which the United States Department of Agriculture may initiate or do within the State is, by the terms of the Memorandum of Understanding, placed under the direction of the Extension Service. The jurisdiction of the Extension Service includes, in addition to the above, all forms of off-campus instruction, and assistance in such subjects of the College curriculum as lend themselves to extension methods, or can be demonstrated and adapted to the direct needs of the people of the State. This plan of cooperative organization has brought to Oregon a wealth of new and valuable information, direct aid in administration, and large financial assistance. This has made possible greater economy and efficiency in the prosecution of Extension work, and has contributed materially to the effective attacking of problems whose solution has meant an increased enrichment of rural home life.

There is presented herewith, in graphic form, the plan of Extension organization which shows the general relationships and interdependence of all the Extension Service. Starting with the Federal Government and the State of Oregon as the sources of financial support, there is next shown the places from which information and other assistance is secured; then the administrative heads of the work of the Department of Agriculture and of the Agricultural College; next the centralization of the organization in the Extension office; and finally the plan of distribution of cooperative effort throughout the State.

U.S. DEPT. OF AGRICULTURE

STATES RELATIONS SERVICE

O.A.C. & EXPERIMENT STATIONS

PRESIDENT AGRICULTURAL COLLEGE

DIRECTOR OF EXTENSION

ADMINISTRATIVE FIELD STAFF

LEADER EXTENSION,  
SCHOOLS, MEETINGS,  
EXHIBITS ETC.

LEADER INDUSTRIAL CLUBS

Six Assistants

County Leaders

LEADER HOME

DEMONSTRATION AGENTS

Assistant Leader

District Leader

Agent Umatilla Co.

Agent Polk Co.

Agent Josephine Co.

Agent Jackson Co.

LEADER COUNTY AGENTS

Two Assistants

County Agents

Baker Co.

Walla Walla Co.

Union Co.

Umatilla Co.

Morrow Co.

Gilliam Co.

Sherman Co.

Wasco Co.

Multnomah Co.

Columbia Co.

Clatsop Co.

Tillamook

Washington Co.

Clackamas Co.

Polk Co.

Linn Co.

Benton Co.

Linn Co.

Lang Co.

Douglas Co.

Cook-Dechutes Co.

Coos Co.

Josephine Co.

Jackson Co.

Klamath Co.

OFFICE STAFF

EXTENSION SECRETARY

Co. Agr. Clerk Steno.

Home Dem. Steno.

Club Clerk Steno.

Markets Steno.

Voucher Filing Clerk

General Steno.

FIELD SPECIALISTS

Horticulture

Dairying

Cow Testing Ass'n.

Farm Crops \*

Animal Husbandry \*

Poultry (14)

Marketing \*

Farm Management

Farm Labor

Entomology

RESIDENT SPECIALISTS

Horticulture (3)

Animal Husbandry (3)

Dairying (1)

Poultry (14)

Agromomy (2)

Farm Management (1)

Organization and

Markets (1)

Plant Pathology (1)

Entomology (1)

\* Positions vacant.

To secure the financial assistance provided by the Cooperative Agricultural Extension Act of Congress (Smith-Lever Act), all Extension work must be on a written project basis. The projects so prepared must be agreed to by the department concerned and approved by the Director of Extension, the President of the College, and the Secretary of Agriculture. Should outside organizations be involved, such organizations become party to these project agreements. The probability of unwise or of wasteful expenditure of state or national funds in a field so large and among such a multiplicity of problems is thus prevented.

The combined experience of the thirty-three northern and western states has shown that the type of Extension organization here outlined has proved most successful, and the project basis of work productive of the most satisfactory results.

#### FINANCIAL SUPPORT.

The Smith-Lever Act, passed by Congress in 1914, provides \$10,000.00 a year for each state accepting the further provisions of the Act. A definite and steady yearly increase above the original \$10,000.00 is received, provided the state meets this increase dollar for dollar. For the year July 1, 1914, to June 30, 1915, Oregon received from the federal treasury \$10,000.00 for cooperative Extension work. Oregon's allotment of funds from the United States treasury during the past biennium was \$43,713.92. For the next biennium the allotment to Oregon under this Act, should the State provide the amount required in excess of \$20,000.00, will be \$58,535.12. This fund provided by the states in meeting the terms of the Smith-Lever Act is called State Smith-Lever fund. During the past biennium the increasing amount necessary to provide State Smith-Lever funds has been met by taking from the \$25,000.00 State Educational Extension fund the sum in excess of \$10,000.00.

For the coming biennium the same method of meeting this increase is impracticable. It would leave nothing with which to conduct the general Extension work of the State as contemplated in Section 1, Chapter 110, General Laws of Oregon. Moreover, when this fund is so applied, it is subject to the same limitations and restrictions in expenditure as the Federal Smith-Lever fund, and cannot be used in Extension work "in established schools of the State, for farmers' institutes, demonstration trains, exhibits at fairs," or in similar ways. The restrictions governing the expenditure of both Federal and State Smith-Lever funds, in conformity to the terms of the Smith-Lever Act and to statements and instructions issued by the States Relations Service of the United States Department of Agriculture in 1914, are being more rigidly enforced each year.

It is very essential, therefore, that the State Legislature not only continue intact the \$25,000.00 fund already available, but make provision for permanently meeting the gradually increasing demand of Smith-Lever offset, and thus perpetuate to the Commonwealth the benefits and advantages of State and Federal Extension work.

To do this would require for the ensuing biennium a legislative appropriation of \$38,535.12. This would provide the State Smith-Lever fund until December 31, 1920, only, or until the next regular legislative session. It would appear to be evidence of much greater business foresight for the

State Legislature to provide not only the amount of State Smith-Lever fund for the coming bi-ennium, but, through an enactment making an appropriation \$3,705.30 larger each year (up to and including 1923, when the maximum is reached) than the amount required the preceding year, to provide permanently for Oregon the maximum total allotments from the federal treasury, as available under the Smith-Lever Act. The amount of yearly increase (\$3,705.30) is based on the rural population as determined by the fourteenth census. The census of 1920 may show a larger rural population in Oregon, which will entitle the State to a still larger yearly increase.

The funds used in the conduct of the Extension Service come from sources as follows:

#### FROM THE STATE

General Educational Extension (now including State Smith-Lever)	\$25,000.00
Cooperative Farm Demonstration (to duplicate funds from the United States Department of Agriculture)	15,000.00
For County Agent Work (to duplicate county funds)	39,850.00

#### FROM THE GOVERNMENT

Federal Smith-Lever	25,562.00
Cooperative Farm Demonstration (duplicated in part by State funds)	15,700.00
States Relations Service	13,828.00
War Emergency Funds	80,000.00

### CHARACTER AND VALUE OF EXTENSION WORK.

The extension work is organized and conducted under the following sixteen projects:

1. Administration.
2. Publications.
3. Extension Schools, Meetings, Fairs and Exhibits.
4. County Agents.
5. Home Demonstration Agents.
6. Boys' and Girls' Clubs.
7. Pig Clubs.
8. Horticulture.
9. Animal Husbandry.
10. Dairying.
11. Poultry.
12. Agronomy.
13. Farm Management Demonstrations.
14. Organizations and Markets.
15. Botany, Plant Pathology, Bacteriology, Entomology.
16. Farm Labor.

In addition to these formal projects, approved by the United States Department of Agriculture, important service and helpful assistance are rendered in other lines of work to as great an extent as limited general funds permit.

The Extension staff, devoting full time to the work, increased during the biennium from 33 to 65 persons. The number giving from one-fifth to one-half time to the work remained about stationary, and includes some 20 members of the resident College faculty. Many additional members of the resident faculty, moreover, devote from a day to a few weeks each year to Extension work.



It has been the aim and the intention, in defining the projects for the biennium, to put into operation and to emphasize those branches of Extension service that are most fundamental, and that reach and serve the largest number of people. To this end, the work of each project leader is outlined in detail at the beginning of the year. Conditions to be met, results to be accomplished, methods of procedure, and territory covered are thus got clearly in mind. Detailed budgets are prepared covering the cost of each line of work, so that each worker knows as definitely as possible, in advance, his entire year's work. The Director of Extension then holds the project leader responsible for the carrying out of the project details and for definite results from the work at the close of the year. We believe this plan provides for the greatest possible economy and highest efficiency in the service rendered.

There follows a very brief statement giving some achievement of value for each project in force during the biennium. A detailed report of each project, giving a full statement of the work, and covering every Extension activity, is on file in the Extension office.

**Administration.** The resignation of Director R. D. Hetzel, about the middle of the biennium, and the instating of the present Director, very naturally resulted in some slight changes in organization and in the direction of the work. Conditions arising because of war emergencies also had a large influence on work planned and work in progress. Every effort has been directed toward meeting the Nation's immediate needs.

An especially helpful and desirable administrative measure, accomplished during the biennium, is the unification, within those counties where two or all are represented, of the main lines of Extension service—County Agent, Home Demonstration Agent, and Boys' and Girls' Club work. Instead of each working as a wholly separate unit, without reference to the plans or operation of the others, they now work through a combined county organization. The work of each is the complement of and supplement to that of the others. Although this united plan has been in operation less than a year, the increased interest and enlarged effect are clearly apparent. There is every indication that the final results will be correspondingly larger and more satisfactory.

Since assuming direction of the work, the Director has spent 178 days in the field; attended and addressed 83 meetings; held 54 Extension staff and faculty conferences, 1614 office conferences with staff members and others relative to the Extension work, and 49 conferences with representatives of the various bureaus and departments of the United States Department of Agriculture. During the same period the Director has dictated and mailed 7708 letters in response to inquiries received and on matters pertaining to the conduct of the work.

**Publications.** The total number of Extension publications issued during the biennium is 180. This does not include any mimeographed material, three emergency war circulars with an edition of 22,000, or the Extension News. The following table sets out in detail the publications issued, showing subjects covered, number in each subject, number of pages, total

of all editions, and cost, by years. A summary total and a grand total for the biennium are also given:

Subjects	Year	No. Publications	Total Pages	Total Cuts	Total Editions	Cost all Editions
Industrial Club Work.....	1917	49	194	3	151,550	\$ 689.49
	1918	62	240	3	108,700	657.90
Horticulture .....	1917	12	148	15	68,000	768.38
	1918	7	52	5	68,500	632.32
Home Economics .....	1917	9	106	29	61,500	662.59
	1918	10	78	1	70,000	627.37
Farm Crops .....	1917	4	20	2	19,500	71.51
	1918	1	4	1	1,000	11.96
Poultry .....	1917	5	68	34	25,000	274.69
	1918	1	4	..	5,000	20.53
Dairying .....	1917	1	16	..	2,500	44.68
	1918	2	24	16	8,000	155.31
Rodent Control .....	1917	2	8	3	6,000	30.94
	1918	1	4	..	3,000	14.45
Entomology .....	1917	2	8	3	5,000	43.78
	1918	..	..	..	..	..
Organization and Markets..	1917	1	16	..	5,000	88.05
	1918	..	..	..	..	..
Plant Diseases .....	1917	1	24	18	5,000	153.03
	1918	1	2	..	5,000	14.66
Animal Husbandry .....	1917	..	..	..	..	..
	1918	1	28	14	5,000	159.63
Miscellaneous .....	1917	4	5	..	27,000	80.70
	1918	4	64	13	38,500	444.61
Totals .....	1917	90	613	107	376,050	2,910.84
	1918	90	504	53	312,700	2,738.74
Grand Totals .....		180	1,117	160	688,750	\$5,649.58

#### Extension Schools, Farmers' Week, Fairs, Institutes, Meetings, etc.

During the biennium 15 regular Extension schools were held, serving 8527 people in 17 counties. An evidence of the appreciation of the people of the State for this type of service is shown in the fact that the number of schools requested during the second year of the biennium was double that of the first. The average length of the schools at each point was also increased.

Among the most successful sessions held were the Grain Grading schools of Eastern Oregon, the Pruning school of Hood River, and the Irrigation school at Redmond. The general sentiment in connection with the Extension schools is shown by the following resolution:

"Whereas, the benefits of the central Oregon Irrigation school, already derived need to be extended and maintained, therefore we, the registrants of this school, respectfully request that necessary arrangements be made to insure the continuance of the school as an annual event."

The two Farmers' Weeks of the biennium assembled at the College a total of 3146 men and women, representing every county of the State. It is interesting to note that, while the attendance was greater in 1916, the registrants of 1917 had a more definite object in coming. Out of a total registration of 1717 in 1916, 399 were undecided or very indefinite in their choice of subjects. In 1917, with an attendance of 1429, but 203 were undecided. In the six subjects most commonly chosen, the registration for the two years was as follows:

Year	Animal Husbandry	Commerce	Dairy	General Agriculture	Home Economics	Horticulture
1916	23	34	29	318	557	11
1917	31	20	27	329	512	6

The Extension staff has rendered service in demonstration judging at fairs as follows:

Year	Number Fairs	Counties	People Met	Number Staff Serving
1916	44	29	18,429	36
1917	35	29	22,640	25

The exhibits of the Oregon Agricultural College at the State Fair, as arranged and supervised by the Extension Service, have been exceptional for their educational value. In 1916, the Home Economics Department, the Eastern Oregon Experiment Station, the departments of Soils, Entomology, Plant Pathology, and Poultry participated. In 1917, the College was represented in Home Economics, Horticulture, Entomology, Farm Crops, Animal Husbandry, Boys' and Girls' Clubs, and Dairying. Similar educational exhibits were placed at the National Apple Show, both in 1916 and in 1917, and at the Land Products Show in 1917. At the Apple Show the Horticultural Department, in a most unique way, emphasized "Eat the right apple at the right time," and "A comparison of the average amount of fruit consumed by the American family 15 years ago and now," respectively.

Telegraphic inquiry from the Secretary of Agriculture asking for a series of patriotic meetings, at which the existing situation as regards agricultural production and war needs should be presented, resulted in a schedule of such meetings being arranged. These meetings were in two series, covering both Eastern and Western Oregon. In all, about 30 points were visited by the speakers assigned, Dr. Kerr and Captain Humphreys. The effect of these meetings was plainly apparent in added response to calls for increased production, and in subscriptions to the Third Liberty Loan.

Other activities falling under this project include the giving of 20 commencement addresses at high schools and thus meeting 10,395 people; attendance and addresses at 46 teachers' institutes within the State; a series of 20 garden lectures to a registered class of 100 at Meier & Frank's auditorium, Portland; a boys' training school at Multnomah County Farm; and three demonstration trains, one in conjunction with the Bureau of Animal Industry, illustrating and explaining wool, and the others Food Preparedness trains.

Correspondence courses and reading circle work are also included. All of the above are reported in detail in the more extended reports on file in the Extension office.

**County Agents.** The keystone of effective Extension Service is the county agent and the county organization. Systematic effort, well directed and as a unit throughout the county in any line of agricultural betterment or rural improvement, is thus made possible and highly effective. Then, too, the county agent is the recognized medium within the county and throughout the State through which the United States Department of Agriculture in any of its bureaus or departments may secure information for the Nation's welfare, or assist the State in the solution of pest control or crop improvement. He is the paid servant of the county.

His lines of activity are chosen by a representative, democratic, administrative body within the county—the county farm bureau. The complete farm bureau embraces representatives from every community in the



county. Through local and county conferences the members of this bureau determine a complete "program of work" for the year. This program, which usually includes more than the work of the county agent, since it comprehends all phases of extension activity, becomes the basis for the budget item which the county acts upon in considering its appropriation for county agent. Adopted by the farm bureau, and endorsed by the county board through an appropriation, this program thus becomes the basis for expenditures of the county, state, and federal funds available for the county agent work of any particular county. The county agent holds no office in the farm bureau, but helps to direct and carry on its work. He is the local representative of the co-partnership composed of the Department of Agriculture, the Oregon Agricultural College, and the county.

Oregon has given generous response during the biennium to the direct request of the Secretary of Agriculture for the establishment of a county agent in every agricultural county, in order that the food production interests of the Nation in the war emergency could be best cared for and with greatest dispatch. At the opening of the biennium there were 12 county agents at work in the State; at the close of the period, 25 counties are thus served. All the important agricultural counties of Western Oregon and the coast territory, except Yamhill and Marion, have, through the cooperative financial assistance of the United States Department of Agriculture, the State and the county, employed an agent. Most of the Columbia counties also have responded to the Nation's call in this respect, and only the large Central Oregon or the broken range counties are yet unsupplied. The detailed report of the County Agent Leader, on file in the Extension office, gives in a most complete and interesting way the development of this branch of Extension Service. The limits of this report will permit mention of a very few concrete instances of service rendered the State and Nation by these energetic and efficient workers.

War service has engaged the attention of the county agents for the major part of the biennium. This service may be grouped under five heads; namely, (1) increased food production, (2) government surveys on war necessities, (3) location and distribution of the best seed stocks, (4) the farm labor problem, and (5) organized rodent and pest destruction for crop protection.

The increase of 700,000 bushels of cereals, beans, and potatoes in Oregon in 1918 is in a large measure a result of county agent effort. This is shown by the fact that a 50 percent increase in wheat acreage was secured in county agent counties, as against 33 percent in non-agent counties. Results in other food production lines show similar differences.

During the biennium the agents have made or assisted in six surveys at the request of the federal government. These include, (1) the most exhaustive crop, livestock, and labor survey ever made; (2) a farm machinery price survey; (3) a survey of threshing machine owners and operators; (4) a monthly survey and report on grains threshed; (5) a survey on use of nitrate fertilizers; and (6) a survey of surplus or shortage of skilled farm workers.

Survey No. 1 was made in close cooperation with the State Farm Help Specialist. A most striking evidence of the value of the agents



in this type of work is shown in the following summary. (a) Gives returns from 22 county agent counties; (b) returns from two counties with county agent organization but no agent; (c) returns from 12 counties without county agent or agent organization.

	Number Farms	Survey Blanks Returned	Percent Returned
(a).....	27,109	13,989	51.6
(b).....	4,969	2,327	46.8
(c).....	9,517	2,970	31.0

County agents rendered very great service in food production by locating and helping to secure the best seed obtainable in spring and winter wheat, oats, corn, rye, barley, beans, and potatoes. The condensed table below gives evidence of the effectiveness of such service.

Total number farmers assisted in securing seed of above crops.....	2,697
Total number bushels of all such seed located or secured for farmers..	81,363
Total additional acres seeded as a result of Production Campaign.....	65,349
Total bushels produced on additional acres seeded.....	699,005
Bushels seed corn saved as result of advice and assistance of county agents .....	4,864
Persons directly assisted in garden work.....	3,217

The effective work done in food conservation by county agents and through the county agent organization in the destruction of harmful rodents, moles, squirrels, gophers, etc., can be partly appreciated by noting the fact that 7,083 farmers cooperated in poisoning these pests on 709,600 acres, using about 30 tons of poison, but saving crops to the value of \$645,550.00. In one county alone the county agent was instrumental in poisoning the rodents over 275,000 acres. He had 800 assistants in the work and they used 5 tons of poisoned grain.

In the food production through preventive measures, the mole destruction campaign offers some most interesting data because of the commercial value of the pelts. The following table, taken from the report of the State Leader of County Agents, serves to illustrate:

County	Mole Pelts Pooled by Agent	Amount Received for Pelts Sold	Value of Crops Saved
Benton .....	809	\$ 225.00	\$ 809.00
Clackamas .....	2,537	590.00	2,537.00
Columbia .....	1,400	336.00	1,400.00
Josephine .....	200	50.00	200.00
Polk .....	315	73.00	315.00
Tillamook .....	900	225.00	900.00
Washington .....	4,389	1,348.00	4,389.00
Coos .....	900	225.00	900.00
Total .....	11,450	\$3,072.00	\$11,450.00

It is definitely known that two Portland firms have this season purchased 22,000 mole pelts. The actual saving, therefore, is not completely covered in the above table, which is based on the statement of the United States Bureau of Biological Survey that one mole will destroy more than a dollar's worth of food in a season.

Space permits mention only in the briefest way of the work of the county agents in land reclamation, soil improvement, bulk handling, labor supplied, and numerous other activities that contribute directly to the advancement of country life and to financial betterment. County agents have been instrumental in the formation and establishment of 6 public and 26 private irrigation systems, serving a total of 45,271 acres; also 7 public and 47 private drainage districts, covering 23,175 acres.

One agent, in an Eastern Oregon county, profiting by the extensive researches made by the Southern Oregon Experiment Station in the use of crude sulfur to increase the yield of alfalfa, has demonstrated that the application of 100 pounds of sulfur to the acre on alfalfa meadows in his county has doubled the yield of alfalfa. As a result of this he has organized an Alfalfa-Sulfur Club, each member agreeing to use from 500 to 24,000 pounds of sulfur on his alfalfa fields. This has resulted in the placing of the largest cooperative order for sulfur for fertilizing purposes ever made—7 car loads. The increase in alfalfa from its use means \$80,000.00 additional crop produced. The pooling of the orders resulted in a \$3,500.00 saving to the farmers of Crook and Deschutes counties.

The county agents have done noteworthy work in livestock improvement during the biennium. Through their direct efforts pure-bred livestock as follows has been purchased and used:

Stallions .....	2
Bulls .....	160
Cows .....	350
Rams .....	70
Boars .....	120
Total .....	702

Work in prevention of livestock disease is indicated in the demonstration vaccination of 13,625 calves for blackleg and septicemia.

We regret that a full account of the work of the County Agent Leader, his assistants, and the several agents cannot be given here. Such an account, however, is on file in the Extension office.

**Home Demonstration Agents.** The progress made in Home Economics during the biennium has been most gratifying. Beginning the biennium with a single worker, the work has enlarged and expanded until the close of the period finds ten workers in the field. National emergency conditions demanded the largest possible conservation and greatest efficiency in the home, as elsewhere. Federal emergency appropriations made possible the placing of seven district workers and the employment of additional administrative assistants. This permitted 18 counties to organize and, under the guidance of the Extension representative, take concerted action in conservation lines. The state leaders and home demonstration agents have put on special state-wide campaigns of national significance, as follows: Dairy, Wheatless, Save Sugar, Food Survey, War Garden, "Can the Cockerel," and Child Welfare.

The limits of this report will permit the telling of but a tithe of the service already rendered. A report of the work of one home demonstration agent will serve as illustration. Through her efforts, in only 500 families in the county, a total of 108,507 quarts of fruits, vegetables, and meats was preserved, with a commercial value of \$33,512.97. This amount was largely in excess of the record for previous years. Add to this 12,678 pounds of dried fruits and vegetables, worth \$1,897.92; 3,180 gallons of pickled and brined provisions; 8,493 quarts, of preserves; 29,715 glasses of jelly; 597 quarts of fruit juice, and 642 dozen eggs preserved, with the returns from the campaign yet incomplete, and the importance of the work becomes apparent. A most conservative estimate shows the net money value of this effort to the county to approximate \$6,000.00.

The home demonstration agent of another district reports 98 percent of the women of the district pledged for conservation; 88 war-bread demonstrations; 1000 dozen eggs preserved in water glass; 50 home dryers made and used; 20 fireless cookers introduced and in service; 30 schools serving hot lunches to the pupils, following a hot-lunch campaign; and 50 women keeping household accounts and on a budget system.

A summary of the work of the agents shows 14 home departments in farm bureaus organized, membership 302; home economics clubs organized, 139, membership 3,327; demonstrations given, 370, attendance 14,048; meetings held, 970, attendance 29,303.

A statistical record of the State Leader and assistants shows 572 days spent in supervisory and organization work in the field; 38 county and community organization meetings held, and 183 field conferences, in addition to the preparation of a number of study outlines, conservation circulars and bulletins, press articles and leaflets which have been distributed to the number of 42,244.

**Industrial Club Work.** The Boys' and Girls' Club work has steadily advanced in importance and interest during the biennium. The encouragement and recognition given this branch of Extension Service by the federal government, together with its direct application in meeting the national food emergency, have attracted our young people, and have invested the work with a dignity, value, and respect unappreciated before by most adults. We can give herewith but a very incomplete showing of the effect and value of this work. It deserves publication in its entirety.

The most noteworthy accomplishment during the biennium is the establishment in 16 counties of paid county club leaders, on a fifty-fifty basis, to continue the necessary supervision and direction of the work during the summer months when schools are not in session. The success of this plan has resulted in the employment of year-around county club leaders in seven counties in Oregon. These workers will devote their entire time to organization, direction, and supervision of Club activities within their respective counties. With a county program of work, which embraces county agents, home demonstration agents, and club work, with county leaders in each line, even more satisfactory returns are expected.

Club work is closely linked to the State school system. Two cooperatively employed full-time Club workers represent directly the office of the State Superintendent of Public Instruction. Moreover, the State Superintendent's office conducts the annual Boys' and Girls' State Fair Camp, attendance at which is won in each county through special achievement in the several Club projects.

The epidemic of Spanish influenza, which closed the schools of the State, has also prevented the receipt of the final reports from Club members. The achievements of individual Club members given herewith are, therefore, taken largely from the results of the first year of the biennium. More striking instances can be secured from the past season's work.



Twelve Club projects were conducted during the biennium. While less than one-quarter of the final reports for the past year have been returned, the summary of results now on file is as follows:

Project	*Enrollment	Value of Product	Cost of Product	Profit
Corn .....	578	\$ 2,135.00	\$ 365.00	\$ 1,770.00
Potato .....	710	1,325.00	285.00	1,040.00
Garden .....	3,739	2,023.00	831.00	1,192.00
Canning .....	1,048	1,804.00	950.00	854.00
Poultry .....	1,309	3,138.00	1,473.00	1,664.00
Baking .....	873	489.00	454.00	34.00
Sewing .....	2,913	905.00	649.00	256.00
Handicraft .....	482	185.00	127.00	57.00
Belgian Hare .....	1,069	2,331.00	1,343.00	988.00
Food Preparation .....	791	546.00	221.00	325.00
Pork .....	1,280	17,484.00	9,652.00	7,831.00
Sheep .....	232	1,484.00	546.00	938.00
Total .....	15,024	\$33,849.00	\$16,896.00	\$16,949.00

In the city of Portland alone there is a total of 5,227 Club members of which 2537 belong to Garden Clubs.

As a single illustration of the money value accruing from Club work we give the financial report of a Club member residing at 928 Mallory Avenue, Portland.

#### Size of Garden 100 by 325 Feet.

##### KIND AND AMOUNT OF PRODUCE

Potatoes, 2,500 lbs. at 2½c.....	\$62.50
Cabbage, 400 lbs. at 1¾c.....	7.00
Corn, 150 lbs. at 4c.....	6.00
Beans, 50 lbs. at 10c.....	5.00
8 crates tomatoes .....	3.20
Carrots .....	1.50
1 sack dry onions .....	2.00
50 lbs. seed onions.....	4.00
7 citrons .....	1.40
60 sunflower heads .....	2.00
30 crates cucumbers .....	3.00
9 pumpkins .....	1.80
12 squash .....	.60
Total .....	\$100.00

##### EXPENSES INCURRED

Rent of garden.....	\$ 7.40
Plowing .....	9.00
Seed .....	7.45
Labor .....	25.00
Total .....	48.85
Net profit .....	\$ 51.15

There were canned for home use from this garden, 48 quarts of tomatoes, 48 quarts of beans, 12 quarts of corn, 60 quarts of pickles, 36 quarts of chili sauce, and 12 quarts of citron.

Reports similar to the above are on file for nearly every project.

**Horticulture.** Results of the projected horticultural work were given in detail in the Director's annual report for 1917. The work for the remainder of the biennium is, in large measure, a continuation of that already reported.

A continuation of the spraying demonstrations for the control of apple pests and diseases, in different localities than previously reported, proves convincingly the value of spraying as indicated below:

\*Exclusive of Portland Clubs.



Area sprayed, 3 acres; trees 11 years old, 55 to the acre. Sprayed 5 times during the season. Cost of spray materials and labor, \$18.22 an acre.

Results secured: Clean fruit, 80 percent; remainder scabby, russet, wormy, or injured. Check trees left for contrast showed clean fruit, 8 percent; injured, 92 percent.

On the sprayed basis and a yield of 200 boxes an acre, there were produced:

160 boxes clean fruit at \$1.50.....	\$240.00
28 boxes scabby fruit at 65c.....	18.20
16 boxes russet fruit at \$1.00.....	16.00
4 boxes wormy fruit at 50c.....	2.00
	<hr/>
	\$276.20

On the same basis the unsprayed trees produced \$24.00 worth of clean fruit, \$93.60 of scabby, and \$40.00 russet and wormy, or a total of \$157.60. The gain for spraying, therefore, would be \$100.38 an acre.

These spraying demonstrations have directly influenced the spraying practice of 2,058 acres of apple orchards.

The Hood River Pruning school, already mentioned, resulted in the adoption of advanced pruning practices on over 1,200 acres of orchard in that county alone.

In the pruning work elsewhere throughout the State, 6,935 acres of orchard have been influenced, and 1,085 people have actively cooperated. The miscellaneous service rendered has covered a diversity of matters, among which were three successful field excursions for apple, prune, and walnut growers, respectively.

During the biennium the horticultural interests have been served in 77 localities of the State, in cooperation with 2,672 people, and influencing directly the production of 17,383 crop acres.

**Animal Husbandry.** The Extension service rendered in animal husbandry during the biennium has been possible only through the strength and resourcefulness of the Agricultural College department. No regular field specialist has been available. The department representatives have done over 150 days field work, held 45 livestock meetings, met and assisted directly or indirectly about 7,000 stockmen and farmers, in addition to the numerous letters written and inquiries answered on livestock topics.

In cooperation with the Bureau of Animal Industry, a wool demonstration car was operated in the Eastern Oregon counties most interested. This trip required two weeks, ten stops at the most favorable points being made. The increased interest in sheep and wool and improvement of the industry, even under the most trying conditions, attest the value of this work.

**Dairying.** Dairy Extension work covers all branches of the dairy industry, production, manufacturing, and marketing. Two full-time specialists and representatives of the College department conduct the work. The cash returns for dairy products in Oregon are above \$20,000,000.00 annually, exclusive of dairy cattle. It is impossible, therefore, in this condensed report to do more than mention a few of the results of the work of the biennium.

The field work includes feeding, breeding, record keeping, construction of farm buildings and silos, organization of testing associations, bull associations and marketing associations, assistance to creameries, and, in fact, the rendering of help in the solution of any dairy problem.

A few of many concrete results secured during the biennium follow: Seven cow-testing associations with 3,270 cows, organized and at work; 23 silos erected and in use; 74 head of pure-bred cattle, representing three breeds, purchased for six different associations or individuals; 14 pure-bred bulls purchased for herd sires; 181 dairy meetings held; 480 farm visits made on specific problems; 5,822 letters written in reply to dairy inquiries; 53 visits to creameries, and 31 conferences with boards of directors on creamery problems.

**Poultry.** Extension service in poultry husbandry at the close of the biennium is cared for by two specialists, one giving full and one half time. During a part of the biennium no field specialist was employed, and the work was limited to the correspondence handled by the head of the Poultry department.

The projects in force at the close of the biennium include Organization, Culling and Selecting, Poultry Farm Demonstrations, and Poultry Records. These will be conducted cooperatively, using the county agent and the county organization to assist.

During the biennium over 9,000 people have been given direct assistance in some phase of poultry production. Culling demonstrations have been the most popular line of work, and these have resulted in the sale of hundreds of unprofitable fowls.

**Agronomy.** Extension service in agronomy includes that rendered in farm crops, irrigation and drainage, soils, and farm mechanics. There is no Extension project in which there is a wider or more insistent demand for help. This is clearly shown by the summary of the report of the farm crops service of the past year which follows:

Grain elevator and bulk handling meetings.....	21
Grain grading schools .....	4
Tractor demonstrations .....	2
Field seed certification .....	9
Conference and special meetings.....	14
General meetings .....	numerous
Correspondence (letters) .....	2,250
Press bulletins and news articles.....	55
Days in field on staple crop problems.....	220

The elevator meetings noted above represent work in 7 counties. The work consisted, first, in showing the advantages of bulk handling of grain; second, preventing wasteful expenditure of money on elevators of too large capacity. The second phase of this work resulted in a reduction of size in seven of the elevators projected, or a direct saving of well over \$100,000.00.

In drainage and irrigation 110 drainage systems were designed or surveyed during the biennium, the tile drains so designed totalling 90 miles in length. These systems, too, have been largely installed. They serve 8,434 acres of land. When completely installed and working, the increase in production from such land approximates \$80,000.00. Fifteen drainage projects were organized, including 84,850 acres. Construction work is already done on about 16,000 acres. Ten irrigation projects have been

given assistance. The area covered is 22,500 acres. Six irrigation pumping plants to serve 200 acres have been installed. Equally satisfactory returns have been received in the work on soils.

**Farm Management Demonstrations.** In farm management demonstrations less service has been rendered than desirable because of the resignation of H. F. Keyes early in the biennium, and later because of the transfer of W. L. Kadderly to the position of Assistant County Agent Leader. The demand for farm management service, however, has grown tremendously, added interest and impetus being given by the income tax law. This work applies directly to the filing of correct income tax schedules.

Through the cooperation of county agents and county farm bureaus the work has been sustained. Farmers in 21 counties have been given assistance; 512 one-year and 87 two-year farm analysis records have been taken; 172 records have been personally analyzed and corrected to farmers' needs; 743 farmers are being helped in keeping accounts; 95 farmers have been given other definite assistance in farm management, and 32 farmers have been helped to complete and balance the year's business.

The disturbed work of the biennium shows but 111 days spent in the field, 29 meetings, 109 conferences, 384 farm visits, and a total of 1277 people met directly in the prosecution of the work. The securing of an experienced leader, the county agents of ten counties making this a part of their program of work for the next year, and the cordial support given the work by the bankers of the State make it safe to predict a more satisfactory report for the coming biennium.

**Organization and Markets.** The field work in this branch of Extension service has been interrupted during the biennium by the transfer of G. L. Hurd to the federal Bureau of Markets, and the transfer of F. L. Ballard to the position of Assistant County Agent Leader.

The work of the biennium has included two lines only—investigation and organization. The two projects of investigation were marketing of dairy products and marketing of potatoes. On these a progress report only has been rendered. War conditions made it advisable to abandon temporarily the investigational projects.

Very active service has been rendered in organization. The Deschutes Valley Potato Growers' Association, almost immediately after the final organization meeting, sold 11 cars of fancy potatoes at 35 cents a hundred above the best individual price offered or received. This Association of some 50 potato growers will produce, grade into four grades, and market their crop.

War conditions brought about a serious shortage of grain sacks, and organization for bulk handling became imperative. Cooperation was effected with the United States Grain Standardization office and the College department of Farm Crops in conducting a bulk-handling campaign. The first part was a vigorous organization campaign for immediate results; the second part, a campaign to awaken interest and provide for definite results later. Farm storage was emphasized in both halves of the campaign. As soon as the Field Specialist began this work, the demand for his services far exceeded the time available. Meetings were



held at 25 points in Eastern Oregon. At 17 of these points elevator companies were incorporated, all, with one exception, under the straight corporation law of Oregon.

The counties thus served include Union, Baker, Morrow, Gilliam, and Wasco, each at two points; Wallowa and Umatilla, each one point; and Sherman, five points. The construction of the elevators is already entirely or nearly completed at nine of these places.

Other organization service includes that rendered the county agent of Baker County in a potato growers' association, the Rockhill Telephone Company, the Sherwood Farmers' Exchange, and others.

Following the elevator organization work, the installation of a uniform accounting system, in cooperation with the United States Bureau of Markets, was advanced and will doubtless be adopted by the 30 farmers' elevators of the State. With the original elevator capacity of Oregon one and one-fourth million bushels of grain, and the average annual crop thirty-five million bushels, the value of this organization and construction work by the Extension service may be appreciated.

Much additional work was done throughout the biennium of which a complete record is on file.

**Botany, Plant Pathology, Bacteriology, Entomology, Etc.** The results of Extension service in these natural sciences are less apparent than in some of the preceding work. During the biennium, however, the total financial saving resulting from this work reaches an immense figure.

In bacteriology the manufacture and distribution of legume cultures are of incalculable value, yet to measure this service in dollars is difficult. The inspection of dairies in the State, in cooperation with the State Food and Dairy Commissioner, is also difficult to measure by a money standard, but the results in health and sanitation are immeasurable.

The plant disease survey and control, the potato inspection and certification, and similar lines of work under plant pathology, are more generally recognized and the results more easily measured. In smut control and eradication, the field men reached 6,421 farmers direct, held 122 meetings, gave 150 seed treatment demonstrations, distributed 5,619 circulars giving treatment directions, and were instrumental in placing 1000 smut posters in conspicuous public places.

In entomology the continued service in the control of clover and garden pests, the demonstrations in the reduction of aphid damage through "aphiddozers," and the most successful campaign in Harney County in the control of grasshoppers, are among the outstanding lines of work of the biennium.

**Farm Labor.** War conditions made the establishment of a Farm Labor Specialist a necessity in the Extension Service organization. This phase of our work, therefore, does not cover the entire biennium, but dates only from November 3, 1917. The work is cooperative with the office of Farm Management of the United States Department of Agriculture.

At the suggestion of the United States Department of Agriculture, the office of the Farm Labor Specialist was located in Portland, although his work is directed through the Extension office. Through the courtesy of the Portland Chamber of Commerce an office room, fully equipped,



in the Oregon Building, was provided. The Chamber of Commerce, too, has rendered invaluable assistance in other ways, without which much of the work done would have been impossible.

The first large undertaking was the crop and labor survey, to which we have referred under County Agents. This survey was made in cooperation with the State Labor Commissioner, and is unquestionably the most exhaustive survey of the State's agricultural resources ever made. In 22 counties the survey was made by the county agents through their county councils; in two counties, the work was done by county agent organizations; in one county, a volunteer committee selected by the Farm Labor Specialist was responsible for the returns, and in 11 counties, the work was handled through other forces. The average returns secured through these agencies have already been given under County Agents. Some exceptions to the averages are worthy of mention. The Jefferson County survey was taken by a committee of three selected by the Farm Help Specialist. They secured reports from over 75 percent of the farms of the County. Marion County, containing, with one exception, more farms than any other county of the State, returned only a 15 percent report. Wallowa, a county-agent county, returned an 88.8 percent report, the highest in the State. Sixty percent of the producing farms of the State, with a total area of 5,631,254 acres, reported. The summarizing of all these reports was made possible by the cooperation of the commercial students of the Salem high school. One hundred and one students voluntarily, under the direction of Mr. J. W. Brewer, devoted an entire week to this work. This report has already been published.

Two wage-scale meetings have been held, at which both spring and fall wages were agreed upon, to the satisfaction of both employer and employee.

A somewhat drastic sample ordinance, dealing with idlers, was suggested to the towns of the State. This ordinance was enacted and enforced in 53 towns.

Oregon farms and orchards have in the past depended largely on seasonal labor from manufacturing centers, saw mills, etc. The call to shipyards this year prevented this usual supply of transient help, and the situation was further aggravated by the large number of country boys and farm operatives who entered military service. The necessary help in strawberry, raspberry, loganberry, and cherry picking was provided through the Boys' Working Reserve and the Women's Farm Reserve. One thousand three hundred and twenty boys, women, and girls were placed directly in these harvest fields. Their total subsistence cost was \$4,383.32, the wages earned \$10,325.68, and the value of the crops harvested \$26,011.36. In addition to this help supplied, there were 500 professional men, clerks, city employees, etc., who signed an agreement to go to the harvest fields on call. Almost 50 percent of these spent their vacation period assisting in crop harvest.

The State Director of the United States Department of Labor writes to the Farm Labor Specialist: "We have more than doubled our farm placement this year, and much of our success has been due to your aid." As these offices worked in the closest harmony throughout, and without duplication, it is easy to see the far-reaching effect of this work.

The Extension Farm Labor Specialist concludes his report by saying: "At no time throughout the past season has there been any serious shortage of farm labor. \* \* \* If the same cooperation is accorded the coming year as given during the past, it will not be difficult to meet the situation."

**Engineering Extension.** Under ordinary conditions we would report engineering extension under Extension Schools. The events of the past year, however, have so advanced this work, and the demands for larger service in this line are so great, that it is accorded this special recognition.

Through the assistance of George M. Cornwall, some three years ago, engineering extension was attempted. During the past biennium the work has been fully established, until now it goes thoroughly into the technique of engineering and leads to professional standing. As an evidence of the success of the work, and in support of the request for still greater enlargement, the record of recognition of those having taken the work is given:

Mr. B advanced from local position paying \$1,620.00 to traveling inspector, United States Fleet Corporation, at \$3,000.00.

Mr. D advanced from local position at \$1,500.00 to inspector, United States Fleet Corporation, at \$2,400.00.

Mr. G, now inspector United States Fleet Corporation, at \$2,400.00; formerly operating engineer at \$1,600.00.

Mr. W, first engineer United States Transport Dix, at \$2,400.00; formerly operating engineer at \$1,500.00.

Seven others, all of whom have been registrants and regular attendants at the extension engineering courses, have been advanced proportionately to those mentioned.

In 1916, the engineering extension course was given in 11 lessons; in 1917 the course was increased to 17 lessons, and in 1918 to 42 lessons.

#### PLANS FOR NEXT BIENNIUM.

The basic policies and fundamental principles of the Extension organization and service are well established and generally recognized. The plans for future development and the policies which govern them are in harmony with those of the States Relations Service. With the retention of these harmonious relations, no change except that of normal growth and expansion is anticipated or desired.

#### EXTENSION LEGISLATION.

To make the Extension Service most effective, and to meet the demands made upon it, changes in the Extension laws now in effect should be made. The original Extension law of 1913, published as Chapter 110, General Laws of Oregon, 1913, should with generous limitations be reenacted. This would involve the repeal of Chapter 281, Laws of 1915, and would provide an appropriation sufficient to meet the offset required under the Smith-Lever Act, as mentioned under "Financial Support" in this report.

Under the amendment cited (Chapter 281, Laws of 1915), the funds required from the State, to secure Smith-Lever in excess of the original

\$10,000.00 yearly, are directed to be paid from the general Extension appropriation of \$25,000.00. The severe limitations upon the use of both Federal and State Smith-Lever funds so deplete the Educational Extension fund that the Extension Service is unable to conduct certain lines of work of great value and importance. We mention in this connection the fact that but 5 percent of Smith-Lever funds can be used for publications, and our necessary publications at present amount to considerably more than this percentage. We have no funds to enlarge our engineering extension to include forestry, highway construction, and allied lines. Smith-Lever funds are not applicable to Farmers' Week, exhibits, demonstration trains, institute work, high-school visitation, correspondence courses, commerce, and the like. In fact, the funds are already depleted to such an extent by the requirement to use the State Extension fund as Smith-Lever offset, that they are inadequate to meet present needs. As the amount required increases by \$3,705.00 yearly, the ensuing biennium will completely exhaust this fund, leaving the College without any fund with which to do this work, or forfeit Oregon's share of Federal funds in the form of Smith-Lever increase.

As indicated in the last biennial report, it is important that a strong series of correspondence courses be established. Personal experience and the evidence presented by other states indicate that there is no activity that may be productive of larger support and satisfactory returns. It is safe to predict a very large enrollment as soon as courses are announced.

Visual instruction material, accompanied by syllabi, for information, instruction, entertainment, and social service, presents an untouched but extremely fertile field for Extension Service. The range of possibilities in this field are practically unlimited, since cooperation from the United States Department of Agriculture and from many commercial organizations, such as the International Harvester Company, may be secured.

The limited extent to which we have already entered the engineering field, and the response and results secured, indicate the possibilities of larger expansion. The work already done has brought expressions from members of the engineering organizations highly complimentary and commendatory.

These enlargements and this helpful expansion are impossible, however, with the restrictions imposed in Chapter 281, Laws of 1915, and with no other provision for meeting the gradually increasing amounts required for Smith-Lever.

If possible, the legislature should provide an appropriation to duplicate the Smith-Lever fund, as contemplated in the Smith-Lever Act. At least \$10,000 a year must be provided by the legislature; unless this is done, it will not only be impossible to enlarge the work, as contemplated by the Federal Act, but work now in progress must be discontinued.

#### ACKNOWLEDGMENT.

In closing we take pleasure in acknowledging the cordial and helpful cooperation the Extension Service has received from the State Food Administration, the State Council of Defense, the State Officers, the Farmers' Organizations, the Railways, the Women's Clubs, many Chambers

of Commerce and particularly that of Portland, the Superintendent of Schools, the State Bankers' Association, from many prominent men and women of the State, and from those farmers and housekeepers who have so generously and willingly rendered the Extension Service helpful and appreciated assistance. We are especially pleased to acknowledge the loyal support and unstinted assistance of the Extension Staff. Their unflagging energy and faithful application to duty have made possible the service here reported.

Respectfully submitted,

O. D. CENTER,

Director of Extension Service.



## REPORT OF THE SCHOOL OF HOME ECONOMICS.

To the President of the College,

Sir: As Dean of the School of Home Economics, I have the honor to submit the following report:

### ORGANIZATION.

During the first year of the biennium 1916-1918 the administration of the School of Home Economics was assigned to a committee consisting of the Dean of Women and the heads of the departments of Household Science and Household Art. On the date of October 1, 1917, the administration was changed by the appointment as Dean of the Professor of Household Science, who had been connected with the School of Home Economics since 1911, for the first four years as Assistant Professor of Household Science and for the two following years as Head of the Household Science department.

The School of Home Economics, which had for many years been divided into only two departments, Domestic Science and Domestic Art, was reorganized during this biennium; it now consists of the four divisions, Household Science, Household Art, Household Administration, and Home Economics Education.

**Present Organization.** As the departments are now organized, Household Science includes all the food courses and the institutional management work. The Household Art work consists of all the clothing and textile work, in addition to some applied arts courses. The Household Administration department consists of the courses which have for their purpose the training of students in the more efficient methods of administering a home, or in scientific management. The courses included in this department are House Sanitation, Home Nursing, Home Management, Mothercraft, and Practice House. In June, 1917, a new division, including the methods and practice teaching of Home Economics, was formed, and was named the Home Economics Education department. This division is one for which the School of Home Economics and the School of Vocational Education are jointly responsible.

**Future Organization.** In order to develop the work of the School of Home Economics most effectively two new divisions should be formed. The Home Economic courses in Art, now given in the Art department, should be combined with the Applied Design, House Decoration, and Costume Design courses now given in the Household Arts department, to form the basis for an Applied Design department. The establishment of such a department would undoubtedly result in a greater application of art principles to household problems. The Institutional Management courses, which are now given in the Household Science division, should form a separate department. The demand for women who have been trained in the scientific management of institutions is increasing rapidly. This training is designed to prepare women to purchase institutional equipment wisely, to plan its arrangement to save labor, to plan meals

according to the demands of individuals under various conditions of health and environment, and direct the preparation and service of these meals. The value and need for such training cannot be doubted. The School of Home Economics has just begun to develop this work, but with the establishment of a department and with adequate facilities for conducting the work there is no reason why the Oregon Agricultural College should not be one of the leading institutions in developing this work.

**Heads of Departments.** The heads of the existing departments are women with exceptional training, experience, and executive ability, especially well qualified for the positions they hold. They have been fortunate in drawing to their departments strong women who are devoting themselves wholeheartedly to their work. With proper organization, with such a staff, and with adequate facilities for the work and proper support, the school cannot do other than prosper.

### REGULAR WORK.

During the past biennium the standard of work in all of the Home Economics classes has been raised and the work intensified, less time being spent on the preliminary courses of foods and clothing. This has been made possible by the increase and advancement of Home Economics work in the high schools, resulting in better preparation for the student entering the Home Economics courses in college.

**Household Science Courses.** In the Household Science courses great stress is placed not only upon the principles underlying the processes of cookery, but also upon the study of food materials in relation to the daily dietaries of families. This is a very important phase of the work, since so much inefficiency and illness today results from the improper selection and use of foods.

**Practice Work.** The department of Household Science has for many years felt the need of greater opportunities for more practice for the students in planning and preparing meals. This need is being partly met by the opportunity afforded in the planning, buying, and preparing of meals in the Practice House, which furnishes a large family unit, and the Boarding House, a small institutional unit. The skill, the speed, and the confidence which students acquire in this course, as well as the putting to the test of their theories, is proving most valuable.

**Institutional Management.** By the further practice in management through acting as assistant managers of the women's residences and the S. A. T. C. mess halls, the students are receiving valuable training which should enable them to fill most excellent positions as dietitians and as institutional managers. This work is of value not only to the group of students just mentioned, but also to those who will have the problem of managing the cafeteria in public and high schools. Many of the teachers of Household Science have this responsibility.

**Household Arts.** In the Household Art studies more emphasis has been placed on the textile side of the work, in response to the conviction that a thorough knowledge of materials and the ability to choose and buy wisely is important for every woman. In the laboratory work design is stressed along with technique and every effort is made to

train the judgment of the students, to develop good taste in dress, and to create a desire for simple, refined, conservative, hygienic, and artistic clothing. An advanced course in textiles is offered in which the principles of economics, of hygiene, of psychology, of sociology, and of art are applied to clothing. The elective courses formerly called "Basketry" and "Hand Weaving" have been changed to Applied Design courses. Very little work in basketry and weaving is given but rather a training in various lines of Decorative Art, the purpose being to develop still further the students' tastes and lead them to **desire** and **use** good color, good line, and good form in their everyday surroundings.

**Household Administration.** The value of the courses in House Administration depends upon the ability to focus the information of all Home Economics or service courses in such a way as to use this information to produce the greatest efficiency of the individual in her relation to her family and community. This means the proper use of time and money, and should therefore result in thrift. Two courses which have recently been established in this department are Mothercraft and Practice House. The former course is of much interest and great importance to women who expect to go into their own homes or who expect to have contact with children in the capacity of teachers or dietitians. The latter course, which was established two years ago, has given most excellent results. A large percentage of our students go into their own homes; and since the home is the most important factor in the training of the young, we consider it wise for every young woman to have systematic training in house management with the Practice House as a laboratory. This house enables the school also to test for efficient home-making the training given in all the Home Economics courses.

**The Training of Teachers.** Until 1917 the possibility for giving adequate training in methods in teaching Home Economics was limited, owing to the lack of a field for practice work. In June, 1917, a division of Home Economics Education for which the schools of Home Economics and Vocational Education are jointly responsible, was formed; and an agreement was made between the city schools and the College whereby practice teaching could be given in the public schools of Corvallis. In this way teaching under real conditions was made possible, and a much longer time devoted to it than under the old regime. By thus providing a means of more practice teaching, one of the necessary requirements for the Smith-Hughes teachers was met.

#### WAR WORK.

**General.** The School of Home Economics has not been unmindful of its responsibility and opportunity in meeting war conditions. The food and textile situation, and the reason for economy and conservation followed by ways and means of conserving, as well as the practice of thrift, have been kept before the students. Many homes throughout the State have been reached and much interest created. As a result many have followed very closely the Food Administration program of conservation, and according to the teachings of the School have planned economical



wardrobes, utilized clothes that have formerly been discarded, remodeled garments, and made children's clothes from the discarded clothes of adults.

This war work has been accomplished by:

1. Students carrying the knowledge gained into their own homes and communities.
2. Talks and demonstrations given by members of the teaching staff to women's clubs, teachers' meetings, Parent Teachers' associations, High Schools, Red Cross units, fairs, county meetings, caterers' associations, managers of clubs, fraternities, sororities, and commercial clubs.
3. Press articles and literature distributed.
4. Food and clothing exhibits.

A permanent exhibit of attractive children's clothes made from adults' garments that had been discarded because out of style, faded, or partly worn has been prepared by the Household Art department and not only used for class purposes but also loaned and used quite extensively throughout the State in connection with fairs, clubs, and like organizations. Much interest in the conservation work has been created through its use.

5. Clothing and Food courses given to
  - a. Oregon Agricultural College students not registered in the School of Home Economics.
  - b. Women of Corvallis.
  - c. Homemakers of the State under direction of the Director of Home Economics, but conducted by Home Economics teachers of the State.

**Administrative Work.** In August, 1917, the Dean of the School of Home Economics was appointed by Mr. Herbert Hoover, Federal Food Administrator, Director of Home Economics for the Federal Food Administration for Oregon. This office has demanded much of her time. Her duties have been to deal with the Home Conservation of the State. She has had charge of the conservation courses which have been generally offered by the Home Economics teachers to the housewives throughout the State, and under the auspices of the Food Administration she has made a lecture tour of the State, reaching grade and high-school students as well as adults. Much of the material published by the Food Administration has been distributed from her office and correspondence for this work alone has amounted to approximately forty-five hundred letters for the year.

### NEEDS.

**Additional Space.** The rapid development of Home Economics and the limited facilities for the work make the immediate completion of the second wing of the Home Economics building seem imperative. For some time it has been impossible to accommodate the Home Economics work in the present unit. Regardless of the fact that all available space has been used, wood rooms, and dressing rooms have been converted into offices and still these small offices are over-crowded and some instructors are without office space. The Rest Room has often been resorted to as



a class room, and recitations are still being conducted in the laboratories, which are not adapted to such work. In some laboratories two recitations are being conducted at one time. Lecture classes have for some time been conducted outside of the Home Economics building, the Dairy and Agricultural buildings having been used. A Household Art laboratory and a lecture room have been located in the new Library building. The conducting of work outside of this building makes supervision difficult and inadequate. Furthermore it necessitates either duplication or the carrying back and forth of all demonstrative and illustrative material.

**Institutional Management Quarters.** At present there are no rooms in this building available for developing the institutional management work. In order to start this work it has necessitated the renting of the first floor of an apartment two blocks from this building. The rental of this, which the School of Home Economics is forced to pay, is excessive but there is no other choice.

**Assembly Room.** For a school of 400 students there should be an assembly room. At the present time there is no available room large enough to hold the entire group of students registered in this school. This congestion and the handicap resulting can be overcome by the erection and equipping of the second unit of the Home Economics building. This unit would afford for the School of Home Economics for several years ample office space, lecture rooms, laboratories, institutional management rooms, and an assembly room, and would result in much greater growth and efficiency in the School of Home Economics.

**Practice House Should be College Property.** The purpose of the Practice House is to give students training in scientific management which implies the least expenditure of time and effort on the part of the management and the worker. In order to accomplish this there should be a few changes made in the Practice House because of the poor arrangement and inadequate equipment in much of the working space. This would involve a very small expenditure, but would result in greater efficiency to the school. Such changes could not be made on rented property. Ownership will result in ability to make needed repairs and improvements. The Practice House, in fact, should be a part of the permanent equipment of the School of Home Economics.

One of the most imperative needs of the School of Home Economics is either an elevator for the present unit of the Home Economics building, or an adjustment of the present stairways to make them more hygienic.

**Equipment.** No money was appropriated this year for Home Economics equipment. With a growing school there is constant need of replacing and adding new equipment, and without such provision much unsatisfactory work results.

**Library Books.** The need of a large appropriation for library books and periodicals cannot be too strongly emphasized. In order to do the most effective work it will be necessary for us to build up our departmental libraries.

## FUTURE.

Although the primary function of Home Economics is to train the student for the most important of all professions, homemaking, there is also a very great service it can render in helping to supply the demand for well-trained Home Economics teachers, Home Demonstration Agents, and other Extension workers, Dietitians, Institutional Managers, Nurses, Milliners, Dress Makers, and Public Health workers. The opportunity of the School of Home Economics for training these trade workers and public health workers is very great, and the College should meet its obligations in this field to the fullest extent possible.

**Service for Teachers in the Field.** The School of Home Economics also looks forward to the future when it can be of more direct service to the great number of its graduates who have already gone out into the teaching field. While it is the policy of the School to keep in touch with its graduates and render assistance whenever possible, there has been no organized system with a definite head to carry on the work. It is the hope of the School that a supervisor of Home Economics be director of such a department and through a well-planned follow-up system render a greater service. In visiting schools throughout the State the supervisor would have an opportunity to learn at first hand the problems and needs of the various teachers and localities. This material should be valuable in planning courses of study in the educational department. The plan of State supervision of Home Economics would thus be of value to the College as well as to the graduates.

**Demand for Graduates.** The majority of Home Economics teachers in our State are graduates of the Oregon Agricultural College. Some of our most recent graduates are in the dietitian service, others are holding teaching, extension, or dietitian positions in California, Arkansas, Colorado, Idaho, Illinois, Iowa, Indiana, Kansas, Massachusetts, Maryland, Montana, New York, Virginia, Washington, Wisconsin, and Nevada. Many of these are college and university positions carrying salaries from \$1200 to \$2200.

**Impetus of War.** The war has given a great impetus to the development of Home Economics. Last year Mr. Hoover made a general appeal to college women urging them to study courses relating to foods. It is not uncommon now to see magazine articles and editorials which emphasize the fact that it is a patriotic duty of the American people to understand balanced rations and their food demands in order to utilize foods most profitably. The part that Home Economics women have been playing in meeting conditions of the war as regards the food and clothing situation has brought the subject most favorably before the public and has been, and will continue to be, the means of influencing many women to take up this line of training.

**Increase in Enrollment.** There has been an increase of 16 percent in the enrollment of Home Economics students during the past biennium, and the registration for the fall of 1918 gives us reason to believe that this year's enrollment will show a normal increase. Of the present enrollment of 395 women in this school, 21 percent are from Alaska and Canada, and from fourteen states other than Oregon. Many of these are

transfers from other institutions. This fact, along with the demand for the graduates, attests the worth of the service being rendered by the School of Home Economics and is sufficient evidence to justify the belief that our School is receiving increasing recognition throughout the country.

**Factors Aiding Growth.** With the reputation the School is establishing, with proper facilities for conducting the work which it anticipates, and with the maintaining of a well-trained staff, which it now has, devoting their efforts wholeheartedly to the best interests of the College, the School of Home Economics of the Oregon Agricultural College is bound to grow.

Respectfully submitted,

AVA B. MILAM,

Dean of the School of Home Economics.

## REPORT OF THE SCHOOL OF FORESTRY.

To the President of the College,

Sir: A recent report stated that the forest schools of the colleges and universities of the United States had furnished for military service a greater percentage of their undergraduates than any of the other departments of institutions of higher learning. Whether or not this statement is true, the following is certainly significant:

During the college years 1916-17 and 1917-18, fifty-six and sixty-six men, respectively, enrolled in the School of Forestry. Of these, fifty-three have entered military service. While this constitutes a splendid military record, it resulted in a decided disorganization of the School.

In addition to the exodus of students, the School has suffered the loss of three members of the faculty. Professor J. P. Van Orsdel, due to war conditions, felt impelled to re-enter commercial life. Professor E. M. Buol resigned in the middle of the college year 1917-18 to enter military service with the Twentieth Engineers, and Professor H. S. Newins left in May to enter the production division of the Signal Corps as inspector of airplane woods. It has been impossible to replace these men. It thus appears that the war has deprived the School of its instructors as well as of its students.

**Logging Engineering.** Events have justified the establishment of this course. All of the twelve men who graduated in Logging Engineering with the Class of 1917 had good positions open to them. When war was declared the entire number offered themselves for military service. Nine were accepted. Of these, three are holding important positions with the spruce division of the Signal Service. Those who did not get into military service are in responsible positions with lumbering concerns. Due to war conditions, only four men graduated in Logging Engineering with the Class of 1918. Three entered military service, in which one, R. K. Wilmot, recently died. Another is employed as a logging engineer.

**Enrollment for 1918-19.** Only thirty-six men enrolled in the School of Forestry for this college year. This small enrollment is due to four things. First, military service, as indicated above, has taken nearly all of the upper classmen. Second, without instructors to give the work ordinarily presented by those who have left, only a limited amount of work could be given. Men did not enroll because they knew that they could not get the work they desired. Third, men feared enrollment in forestry would make assignment to the spruce division certain. They desired over-seas service. Fourth, the emphasis placed by the War Department on engineering training led men who, under normal conditions, would have entered the School of Forestry, to take up some branch of work in the School of Engineering.

**Cooperation with the Industry.** The Federal Forest Service preserves a very helpful attitude toward the School, furnishing opportunities for practical field work for undergraduate students and remunerative employment for graduates. Practical loggers have always shown a lively



interest and a willingness to assist in every feasible way. Undergraduate students have repeatedly been given opportunities to perform field work in logging camps at much inconvenience to owners, but with much profit to the students. Costly equipment has been loaned to the College by manufacturing concerns and manufactured-wood products in the form of sash, doors, and sawn lumber have been generously contributed by saw-mill companies.

**The Future.** It is certain that many of the men who left College to enter military service will return to complete their training. It is equally certain that, due to the magnitude of the lumber industry in the Northwest, many young men will want to prepare themselves to engage in it. Since modern industrial methods are being applied to the industry, operators are coming to realize the necessity for employing trained men. Naturally they are looking to the colleges to supply these men. The Government of the United States has evidently adopted a settled policy of forest development. This means that there will be a constant demand for trained foresters both in this and in other states. There should be a constant effort on the part of the School to supply this demand.

There will be an increasing demand for trained men to harvest the timber crop of the State. Oregon has the largest crop of standing timber of any state in the Union. This tremendous economic resource should be gathered economically and efficiently. This is a plain duty. Whether or not this is done depends upon the ability of those directing the work. They can be highly efficient men if the School of Forestry of this College is maintained at a high degree of efficiency. It can be an efficient organization with reasonable financial support.

Respectfully submitted,

GEO. W. PEAVY,

Dean of the School of Forestry.

## REPORT OF THE SCHOOL OF ENGINEERING AND MECHANIC ARTS.

To the President of the College,

Sir: I have the honor to submit the following biennial report for the School of Engineering and Mechanic Arts for the period ending June 30, 1918.

The organization of the School and the courses offered remain practically as they were at the time of the last report except for the restoration of the course in Civil Engineering. This act of the Board of Higher Curricula at its annual meeting in 1917 enables the College to offer again the standard course in Civil Engineering with the optional groups leading to highway, irrigation, and structural engineering in the senior year.

The general courses now offered in this School are:

- Electrical Engineering,
- Civil Engineering,
- Mechanical Engineering,
- Industrial Arts.

There are also two-year's vocational courses offering a choice of major work in woodwork, blacksmithing, foundry, and machine shop, together with courses in mathematics, English, history, drawing, and elementary science. The status of these courses and of the students taking them was normal up to June of the present year.

**War Conditions.** On June 15, 1918, the College began intensive training of soldiers in vocational courses, under contract with the U. S. Government. The first detachment consisted of 247 men assigned to courses in Auto Mechanics, Blacksmithing, Carpentry, Radio Operation. At the end of the contract period a second detachment of the same number of men succeeded the first in the same lines of work. At this writing a third detachment of 526 men is pursuing vocational courses in:

- Auto Mechanics,
- Blacksmithing,
- Carpentry,
- Radio Electricity,
- Foundry,
- Machine Shop,
- Radio Operation,
- Surveying,
- Topographic Drawing,
- Tractor Operation.

The course in Tractor Operation accommodating 100 men is given in the School of Agriculture. This leaves 426 men to be taken care of in the shops and laboratories of the School of Engineering. All of this work is vocational, or Section "B," as defined by the Committee on Education. With these large classes in shops and laboratories six hours a day, it will readily be seen that much equipment is in constant use

and not available for use by our engineering students of the College grade known as Section "A" men.

Section "A" includes all men in the service who are taking the regular courses in engineering.

The place allotted to trained engineers in war work and the publicity given this subject by Government Officials and others, have greatly stimulated the desire for engineering education among college students. In December, 1917, the War Department issued an order permitting men of good standing in regular engineering courses in college to enlist in the Engineer Enlisted Reserve in order to complete their college training before entering active army service.

With the inauguration of the Students' Army Training Corps at the College this year, students were encouraged to enter engineering courses. By order of the Committee on Education and Special Training of the War Department, all engineering courses were placed upon a two-years' basis, extending through the twelve months of each year. Non-essentials were eliminated and definite intensive courses provided for the purpose of fitting the men for active duty at the earliest possible moment.

The result of all this activity has been a sudden increase in the number of students in engineering to a figure never before reached or regarded as possible.

The School of Engineering was confronted with the difficult problem of caring for more than three times the normal number of students and at the same time making radical changes in curricula, and all of this with rooms and equipment insufficient to satisfy the normal demands of the institution.

Thanks to the hearty cooperation of members of the faculty of other schools and the untiring efforts of our own staff members, these problems have been solved, for the present at least. All of the work is being regularly given by experienced teachers and under conditions not greatly differing from normal. When faculty members of other schools or departments have undertaken work in the School of Engineering they have been assigned to work which they were well qualified to undertake. Some instances are: Professor Robinson of the department of Architecture, and Professor Brandon of the Industrial Arts department, now giving practically full time to Mechanical Drawing, Professor Peck of the department of Landscape Gardening, giving nearly half time to Surveying, Professor Teeter of the Irrigation department, now giving nearly full time to Mechanical Engineering. With these experienced men working in full harmony and in cooperation with the engineering staff members, I feel that no apology is necessary for the quality or quantity of work accomplished in the School of Engineering under the unusual conditions with which we are surrounded.

**Future Outlook.** No very definite plans for the future can be made until the policy of the War Department and the Committee on Education is worked out and published. In general, the importance of engineering training in state institutions will be clearly established by the present crisis. It was to these institutions that the Government appealed first for assistance in the training of men for engineers and for mechanics.

While the results may not have been entirely satisfactory, yet the response was so hearty and the effort so sincere that the service could hardly fail to be of real value.

Changes of great moment in methods and curricula of engineering schools will be hastened by the war. Just what these changes will be when peace is fully established no one seems to know. Dr. C. R. Mann has just published in Bulletin No. II of the Carnegie Foundation, the result of a very thorough and exhaustive investigation of engineering education in this country. His opinion seems to be that the time is at hand for some very marked changes both in subjects taught and in methods of teaching. He admits, however, that each institution must study its own peculiar problems and work out the solution.

It seems probable that the demand for men trained along engineering lines will be greatly enhanced during the reconstruction period following the war. It seems also that engineering schools will have to study the demands of industry and offer courses that will meet the requirements, eliminating non-essentials; and finally that precedent established by long years of academic practice will have to be broken and give way to a searching analysis of the real problems involved.

**New Engineering Building.** In former reports attention has been frequently called to the need of more room for the work of the School of Engineering. It was pointed out that there were not enough recitation rooms for classes, and that instructors were required to shift from room to room and from one building to another in order to meet their classes. It has also been pointed out that the engineering laboratory work was given in three different buildings widely separated and in rooms entirely unsuited to the purpose.

Needs which were well defined two years ago are now acute and extremely urgent. The increase of over 300 percent in the number of students handled in the School of Engineering has created a situation which could not have been handled at all except for the fact that room was made available in other buildings by a temporary decrease of students in some other courses. As an illustration of this statement, there are 278 students taking mechanical drawing in the Horticultural building, 163 in gas engine laboratory in the Forestry building, 155 reciting in engineering subjects in the Administration building. All of this is regular work of college grade. There are also 174 students in Section "B" receiving instruction in radio operation, radio electricity, and automobile laboratory in the Forestry building. This arrangement would not be possible in normal times, since these rooms would be in use by other students. Under such conditions, moreover, the work is carried on at a great disadvantage and with consequent loss of efficiency. Apparatus and equipment must be often transferred from one building to another across the campus. Supervision is difficult and there is a certain loss of interest on the part of both students and faculty. The only remedy for this unsatisfactory condition is a new engineering building, conveniently located near the present engineering groups, and designed to meet future requirements.



This building should have not less than 36000 square feet of floor space. It should provide accommodations for all of the engineering laboratory work, now given at widely separated points on the campus. It should also provide drafting and class rooms for civil, mechanical, highway, and irrigation engineering, and should have an assembly or lecture room for all engineering students. Such a building should cost not less than \$100,000, and have ample equipment to make it at least the equal of any engineering building in the Northwest.

Such a building and equipment would place the School of Engineering in a position to render a most valuable service to the young men of this State in giving them the training which they must have if they are to take their full share of work and responsibility in developing the resources and building up the industries of Oregon.

Respectfully submitted,

G. A. COVELL,

Dean of the School of Engineering.

## REPORT OF THE SCHOOL OF MINES.

To the President of the College,

Sir: I submit herewith the following report on the work of the School of Mines for the past biennium.

**Departments of the School of Mines.** The organization of the School of Mines includes the following departments: Mining Engineering, Geology, Metallurgy, and Ceramic Engineering. The last-named department, Ceramic Engineering, has been temporarily discontinued since September, 1918, owing chiefly to lack of sufficient demand by students for work along these lines during war times.

**Degrees Offered.** Four-year's courses leading to the degree of Bachelor of Science in Mining Engineering, Mining Engineering in Geology, and Ceramic Engineering are offered, except that the last named degree, Bachelor of Science in Ceramic Engineering, is temporarily discontinued until work in the department of Ceramic Engineering is resumed. Advanced degrees of Mining Engineer, and Mining Engineer in Geology, are conferred upon the completion of the requisite amount of graduate work. The degree of Bachelor of Science in Mining Engineering (Geology) is offered this year for the first time, and has been added in order to meet the demand for specialists in economic geology or geologic engineering.

### STUDENT ENROLLMENT

	1917-18	1918-19
Degree courses .....	41	48
Service courses .....	75	78
<b>TOTAL .....</b>	<b>116</b>	<b>126</b>

The above figures show an increase over 1917-18 of nearly 15 percent in student enrollment in the School of Mines for 1918-19, in spite of the fact that more than half of the mining students who were in College last year joined various branches of the military service, and therefore did not return. The above figures also show that the enrollment of students in service courses in the School of Mines has been about the same throughout the biennium. It will also be noted that the number of students enrolled in service courses in the School of Mines is nearly double that of students registered for degrees in Mining Engineering or Geology. With the return to normal conditions which will follow the period of the present emergency, the number of students enrolled in service courses may reasonably be expected to be 50 percent greater than the figures shown here, due to the fact that several departments in the College have been obliged to eliminate geology from their curricula in order to conform to the requirements of the S. A. T. C.

**New Equipment.** During the college year 1917-18, the following new ore-dressing equipment was added to the metallurgical laboratory: small laboratory-size concentrating table; small laboratory-size jig; small laboratory-size classifiers; small laboratory-size flotation machine; and small laboratory-size automatic feeders.

**Faculty.** During the past biennium several changes in the faculty of the School of Mines have been made. Edgar K. Soper was appointed Dean of the School of Mines at the beginning of the college year 1917-18 to fill the vacancy resulting from the resignation of former Dean Henry M. Parks. Charles Edward Newton was appointed Associate Professor of Metallurgy at the beginning of the college year 1917-18 to fill the vacancy made by the resignation of Professor Will H. Coghill. Vacancies in the Mining Engineering department and Ceramic Engineering department, resulting from the resignations of Mr. George Elwin Stowell, and Professor Ira A. Williams have not yet been filled.

**Service Courses.** The work of the School of Mines may be classified under two distinct heads: (1) technical work in Mining Engineering, Geology, Metallurgy, and Ceramics for students who are candidates for any of the degrees offered in the School of Mines, or for special students not candidates for any degree, but who are taking their major work in the School of Mines; (2) special service courses offered to meet the demands of other schools or departments of the College for students who are taking their major work in these other schools or departments. For example, students in the department of Agronomy, School of Agriculture, are required to take studies in geology, and therefore a special course and section in Agricultural Geology is given for such students. Again, a special course in Forest Geology is offered for students in the School of Forestry. Special courses in Engineering Geology are offered for students in the School of Engineering who desire to include geology in their course of study. A special course in the properties and use of explosives is given for members of the Students Army Training Corps who desire to enter either the engineering or artillery branch of army service. The demand for these special courses in Geology, Explosives, Metallurgy, etc., for students other than those registered in the School of Mines is constantly growing, and hence this division of the work of the School of Mines is continually increasing in importance.

**Mineral Determinations.** The School of Mines is called upon to examine, identify, and analyze a large number of samples of ores, rocks, and minerals which are sent in to the School from every section of the State. The volume of this work, which increases each year, requires considerable time from the various instructors, and the tests require the use of chemical reagents and supplies, the total value of which amounts to a considerable sum each year. During the past year arrangements have been made to charge the sender of samples the regular commercial rate for assays and analyses in order to cover the expense of this work for which no appropriation is made.

**New Courses and Other Changes in Curriculum.** Since September, 1917, the following new courses have been added to the curriculum of the School of Mines:

- (1) Problems in Economic Geology.
- (2) Interpretation of Geologic and Topographic Maps.
- (3) Explosives: their Properties and Use, for members of the S. A. T. C., engineering and artillery branches.
- (4) Military Mining and Geology, for members of the S. A. T. C. engineering and artillery branches.

- (5) Excavation and Quarrying, for members of the S. A. T. C., engineering and artillery branches.
- (6) Mine and Metallurgical Design.
- (7) Excavation, Explosives, and Blasting (for mining students).
- (8) General Metallurgy.
- (9) Metallurgy of the Minor Metals.
- (10) Engineering Geology.

Another important change in the curriculum of the School of Mines during the past biennium, has been the merging of the work in Chemical Engineering, formerly offered in the School of Mines, with the new department of Industrial Chemistry, which was created at the beginning of the college year 1917-18.

**Reorganization for Students Army Training Corps.** At the opening of the college year October 1, 1918, it became necessary completely to reorganize the work in the School of Mines to conform with a similar reorganization throughout the College, to meet the demands of the War Department in providing the approved courses of study for members of the S. A. T. C. This reorganization and revision is still under way [November 10] but the following important changes have already been effected:

- (1) The college year which was formerly divided into two semesters of approximately four and one-half months each, is now divided into four quarters of twelve weeks each.
- (2) The courses in the School of Mines have been revised to meet the new conditions resulting from the change to the four-quarters system.
- (3) Certain courses have been temporarily dropped from the curriculum of the School of Mines, and certain new courses of immediate military value have been added to meet the requirements of the Committee on Education and Special Training of the War Department.
- (4) The requirements for the various degrees conferred by the School of Mines have been changed to conform with the requirements of the S. A. T. C. The degrees of Bachelor of Science in Mining Engineering and Mining Engineering (Geology), are now conferred upon the completion of two years, or eight quarters of intensive training. The new degree courses follow the general plan of the model courses in Mining Engineering and Geology submitted by the Committee on Education and Special Training of the War Department.

**Additional Help Required.** The vacancy in the department of Mining Engineering, resulting from the resignation of Mr. George Elwin Stowell is still unfilled. An Assistant Professor or Associate Professor of Mining Engineering will be required to complete the staff of the School of Mines, and provide adequate instruction in Mining Engineering subjects.

Respectfully submitted,

E. K. SOPER,  
Dean of the School of Mines.



## REPORT OF THE SCHOOL OF COMMERCE.

To the President of the College,

Sir: In compliance with your request of November 5 I am handing you herewith a brief report on the activities of the School of Commerce during the biennium ending June 30, 1918, with estimates and recommendations for the biennium ending June 30, 1920. My report of June 30, 1916, was somewhat exhaustive so that the present report is little more than a supplement. Since comparatively few are familiar with the history of the School of Commerce, I would suggest that reference be made in your report to the last biennial report containing historical data on the commercial courses since they were introduced into the College in 1867.

### ENROLLMENT.

The scope of the work in the School of Commerce is shown in the following table on enrollment.

TABLE I. ENROLLMENT OF STUDENTS IN COURSES OF THE  
SCHOOL OF COMMERCE

Year	Registered Commerce Students	Students Registered in other Schools
1915 .....	170	1,015
1916 .....	173	995
1917 .....	212	1,096
1918 .....	298	1,305
1919 (to Oct. 19).....	463*	1,230

\*This number includes men who were later transferred to other departments, so that the final number may be considerably reduced.

TABLE II. GRADUATES IN COMMERCE

Year	No. Graduates
1915 .....	19
1916 .....	14
1917 .....	22
1918 .....	*11

\*Total since 1907, 172.

### INSTRUCTIONAL WORK.

Except for the reorganization of the courses of study, due to the war, there have been few changes in our instructional work. One course has proved so successful as a war emergency course that I am recommending that it be a permanent feature of our work; namely, the course in Civil Service. There is a great opportunity in this work, and I recommend that as facilities make it possible we expand this course so as to cover practically the entire field announced by the Drexel Institute of Philadelphia. We are encouraged in this work by the recognition given it by the Civil Service Commission, in a letter from President McIlhenny as follows:

"The Commission desires to state that an examination of your catalogue discloses the fact that you are already giving all the courses prescribed in the Drexel Outline at this time. It will, therefore, be unnece-

essary for you to arrange special courses, and you are hereby authorized to prepare students for certain Civil Service positions in your regular advertised courses."

In connection with the Civil Service course we should offer work in stenotypy. This will require considerable initial outlay for equipment, but an additional fee should be charged to cover the cost.

There are two courses, however, which we are not giving and which ought to be made a part of our work; namely, a course in Business Statistics, and a course in Government Accounting. The latter course has been given as a war course and though given under considerable difficulty, it has proved interesting and effective. There is no literature on which to base the instruction for this course, but it is doubtless in a process of preparation.

Social Leadership is another course which is being emphasized by our department of Economics and Sociology. The growing demand for our work by students in other departments, shown in the preceding tables, indicates that we shall have to develop courses as they are required, and I have reason to believe that we are entering upon an unprecedented period of expansion in the work of the School of Commerce. It is the adaptability of the commercial courses to various vocations of life which has earned for the School of Commerce of the Oregon Agricultural College a considerable reputation beyond the State.

Our course in Cost Accounting needs to be greatly strengthened and developed. There is a new science which is attracting a great deal of attention; namely, Financial Engineering, or the "science of rendering service at the least cost." This is a subject which has been emphasized by the School of Engineering and should be given attention in every industrial department of the institution. To fill the vacancy caused by Mr. R. M. Howard's resignation, we should secure an expert in Cost Accounting to develop this subject in cooperation with other departments interested.

The war has made evident not only the opportunities but also the responsibilities of the United States in Latin America. During the past years, some of our men have been going to the Latin American countries to render expert service in their special fields. A course in Latin American Institutions should be introduced into the department of Government and Business Law. The desired course contemplates a brief study of the resources of the countries, the peoples, and their governments.

There is still another course which must be developed as soon as the institution settles down to its normal condition; namely, the course in Commercial Education. This course is given under the direction of the School of Industrial Education and is in charge of Dr. Elmer W. Hills. The function of this course is to give special training to prospective teachers of commercial subjects. Although the special course is not outlined, a limited opportunity will be afforded graduate students in Commerce, and others who are qualified, to work on special problems relating to teaching.

Our courses of study are completely analyzed in my last biennial report.

To summarize, we should introduce the following additional courses:

1. Advanced Cost Accounting.
2. Governmental Accounting.
3. Business Statistics.
4. Social Leadership.
5. Latin American Institutions.
6. Stenotypy.

The work of the School of Commerce has been limited in scope to courses leading to the Bachelors' degree. While this has retarded the growth of the School in its more advanced courses, it has had the effect of strengthening the work already offered. It will be the policy of the School in the future to bring every course up to the highest standard of efficiency.

No important changes are contemplated other than those indicated above and no new courses can be introduced without approval of the Board of Higher Curricula.

As a result of the growing demand for commercial courses from other departments, a very important change of policy was made three years ago. The courses in the Junior and Senior years were made entirely elective, the only requirement being a certain number of credits in Commerce courses. The result is that the student may, with greater freedom, major in Commerce and minor in other courses, or major in some other school and minor in Commerce.

#### EXTENSION ACTIVITIES.

Let me call your attention to the extension activities as sketched in my last biennial report. These activities have kept pace with the growth of the institution and I think it is fair to say that the School of Commerce is doing its share in the extension work of the College. Work reviewed in my last report included rural conferences, short-course lectures, and itinerant schools in which the School of Commerce had taken an active part. Special service of the department of Economics, particularly in the Bureau of Markets, was mentioned. The work of the School included not only lectures in Oregon on accounting methods, economic subjects, business and rural law, office training, and the teaching of commercial subjects, but also lectures in various parts of the United States by members of the School who are recognized as authorities in special fields. The correspondence work in Farm Bookkeeping, Agricultural Economics, Business and Rural Law, and Stenography was also specified as a valuable field of the School's Extension service. These various lines of Extension work are characteristic of the School during this biennium as well as the last.

The collaborative work with the Bureau of Markets has been continued. This summer the writer made an extensive trip through the cotton belt of the United States, investigating the accounting and business practice of cotton ginneries. While having no direct connection with our work, the investigation has the effect of bringing the institution before the country and of adding important material for use in our classes.

Special credit is due the department of Government and Business Law for its activity in the War Aims courses. Below is a summary of the number of men the department has reached in these courses:

1. July 1 to Aug. 15—War Issues lectures to detachments of 250 men.
2. Aug. 15 to Oct. 15—War Issues lectures to detachments of 250 men.
3. During College Year—War Aims lectures to 500 detachment men, Class B.

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**Note**—The lecture series to the detachment men includes eight lectures given to the men in groups of from 50 to 100.

4. For about 1200 Class A men, one lecture a week on War Aims given in groups of 100 to 150 men.

The department of Economics has also done very effective work. Dr. Macpherson has lectured on Economic Causes of the War to the Class A men, numbering about 1200, in groups of 100 to 150.

No less important is the course in War Paper Work which has been given jointly by the departments of Business Administration and Office Training. Upward of two hundred men have taken this work and have contributed in no small degree to the efficiency of the military office work.

#### CHANGES IN FACULTY.

There have been few changes in the faculty since my last biennial report. During the summer of 1917, Mr. H. T. Vance accepted a position with the American Linseed Company and he is now vice-president of that institution. We were fortunate in securing Dr. Elmer W. Hills to succeed Mr. Vance. Though he is at present serving as a commissioned officer in the army, he will be permanently connected with the institution as head of the department of Office Training and Commercial Education.

Dr. L. A. Rufener, who was assistant professor in Economics, severed his connection with us last spring to accept a position in the Civil Service at Washington. Dr. Wm. H. Dreesen succeeded him last September.

Miss Lillian Burns and Miss Bertha Whillock have been added to the faculty of Office Training.

Mr. R. M. Howard has been granted a leave of absence from the instructorship in Accounting to accept a commission in the army.

#### ROOM.

In my last biennial report I made the following statement with reference to the equipment and room. "The School is now almost completely equipped for efficient work. Our policy is to purchase nothing that is not imperatively needed. We have no dead equipment; all is in constant service in class rooms and laboratories." We now own fifty-five standard typewriters which are in constant use in our department of Office Training, compared with eighteen rented machines in 1912. That year the entire School was comfortably quartered on the third floor of the Agronomy Building. Now that space is occupied by the laboratories, and it is necessary to occupy some of the biological laboratories at times by overflow sections in Office Training and Accounting. To illustrate the congested



condition of our quarters: I am giving a course in Government Accounting, using three different rooms without suitable desks. While we shall do our best with our limited room, we must anticipate considerable enlargement of quarters. In 1916 I stated that my preference would be to vacate our present quarters and be assigned to the rooms then occupied by the Library and the department of English, as soon as the new Library was completed. Now that other plans have been adopted for the use of those rooms, it becomes necessary for us to plan for expansion either in the Agricultural Hall or elsewhere. It seems to me that the only feasible plan is for one of the departments to vacate their present quarters and to divide the rooms thus made available with other departments. It would probably be more convenient for the department of Government and Business Law to move than for either of the other departments.

#### IMPROVEMENTS.

Additional room for the Office Training department is essential to maintain the standard of our work. Plans for securing the necessary room, and for providing adequate facilities for thoroughly modern training, have been drawn up in detail and submitted to the Superintendent of Buildings.

#### EQUIPMENT.

The great increase in our enrollment in Office Training compels us to provide additional facilities for the laboratories of the department of Accounting and Office Training. These facilities should include additional locker cabinets for 160 students, five new machines for the course in stenotypy, a mimeograph, noiseless typewriter, and other equipment of a minor or miscellaneous nature.

#### FINANCE.

Elsewhere I give a summary of the expenditures of the two years ending June 30, 1918, and estimates of the requirements of the present biennium.

Respectfully submitted,

J. A. BEXELL,

Dean of the School of Commerce.

## REPORT OF THE SCHOOL OF PHARMACY.

To the President of the College,

Sir: I have the honor to submit herewith a report of the School of Pharmacy for the past biennium with a statement of the condition of the School, and certain recommendations regarding its future development.

It is a pleasure to be able to report that even under war conditions which required frequent adjustment of the work, there has been a decided improvement in the affairs of the School over the preceding biennium. There has been a substantial increase in attendance; the standard of work has been advanced; the courses of study have been revised and strengthened; new equipment has been provided. All of this has added greatly to our facilities for efficient work.

**Courses in Pharmacy Recognized.** During the past biennium the work of the School has been improved and standardized in accordance with the best practice in schools of pharmacy. The work now offered is of such character that it is recognized by the New York State Department of Higher Education, which has registered our three courses. The advantage of this registration is that our courses are rated in the class with those offered in the best schools of pharmacy in this country. Our students will now receive full credit for all work completed in all other schools similarly registered.

At the 1915 Convention of the American Conference of Pharmaceutical Faculties, our School was admitted as a member. The object of this organization is to promote the interests of pharmaceutical instruction. As it exacts high requirements for admission and membership, only the better grades of schools of pharmacy are eligible for membership.

**Effect of War Conditions.** Although there has been a decided shortage of drugs on the market during the past biennium, due to the war, I am pleased to report that this shortage did not in any way alter the nature of our laboratory courses. This was due to the fact that we ordered some of our supplies in large quantity in 1914, and this stock, together with what we could easily purchase, made it possible to give the same experiments as before the war.

**Instructors in Military Service.** Several of our instructors entered military service, and as this was true in every school in the country, we were unable to engage qualified assistants to replace them. This condition made it necessary for the regular staff to teach heavy schedules; however, we offered all courses and accomplished as much as during normal times.

**Courses of Study.** Our work is now standardized so that we require full four-years high school work as a prerequisite for graduation from all courses. This high requirement prevails only in the best schools of pharmacy. The vocational course which was offered for two years, and which required only two-years high school for entrance was discontinued, and a three-years course, leading to the degree of Pharmaceutical Chemist was substituted. The School now offers a two-, three-, and four-years course.

**Attendance.** There has been a gradual increase in attendance during the last two years, and during the present year our attendance increased 108 percent over last year. It is gratifying to note that students come to us better prepared than in the past. With better student preparation, much better college instruction is possible.

**Instructors Needed.** With the increase in attendance and the raising of standards in all courses, there is naturally more work to be done by the staff. With higher requirements, more personal attention to each student becomes necessary, especially in laboratory courses.

In addition to our regular teaching schedule, we have been compelled to teach all courses in pharmaceutical chemistry for the department of Chemistry, as this department was unable to engage an instructor. The three additional courses are: Alkaloidal Testing, Drug Assaying, and Food and Drug Analysis.

As these are junior and senior courses, and consist principally of laboratory work, they take up a great deal of our time that should be devoted to our strictly pharmacy subjects.

During the past biennium, correspondence and executive work have almost doubled in amount. It requires all spare hours of the Dean to take care of these details, some of which could be taken care of by a properly qualified assistant.

In the interest of the profession, the School of Pharmacy should publish something each month in the drug journals published on the Pacific Coast. Under present conditions this is not possible, as our time is taken up with regular instructional work. I, therefore, recommend that another assistant be employed who could assist in instructional work as well as in all other work of the School.

**Drug Laboratory Needed.** Each year druggists of this and other states send in more drug samples to be tested. Some of the work can be done by the small amount of equipment we have on hand. We are compelled, however, to return many samples without the desired information as we are not equipped for general work. We expect the cooperation of the practical druggists, but unless we are in position to assist them in solving their problems, we do not come up to expectations. Not only is practical analytical work of benefit to students and faculty, but it would eventually be the means of establishing one or more fellowships in the School. This is one of the very few schools of pharmacy that does not maintain a drug laboratory, and in order to serve the profession of pharmacy in a scientific way, a laboratory should be established.

**Drug Garden.** In my last report, I called attention to the necessity of establishing a drug garden at the College. Not only is this of importance to improve drug cultivation in this State, but it is indispensable for instructional work. From the interest shown in drug cultivation during the past two years, I am of the opinion that it will soon become an important industry in Oregon. This State is peculiarly adapted to drug cultivation, but before the work can be successful, experiments must be conducted to improve cultural conditions.

**Graduates.** I am pleased to report that all of our graduates are successful in their different lines of work. To date, none of our graduates

has failed to pass the examinations of the State Board of Pharmacy, and their averages are certainly creditable. From reports of military officers in charge of army and navy medicinal departments, I have learned that many of our graduates are successful in the lines of work in which they are engaged. Many are acting as instructors, others as chemists and dispensers in base hospitals in this country and abroad. A large number are engaged in various lines of work in the Sanitary Corps; others are commissioned officers, either in the army or navy.

**Department of Pharmacy Made a School.** At the meeting of the Board of Regents in June, 1917, the original department of Pharmacy was raised to the rank of a school. This action was a decided stimulus to both faculty and students, as it placed our work on a higher plane. Our graduates now receive full credit from graduate schools and others, notably from schools of Medicine, for all work completed in this institution.

**Digitalis Campaign.** When war was declared, the School of Pharmacy organized a campaign for the collection of wild digitalis, or foxglove, for use in the Medical Department of the army and navy. The plan of the campaign was that citizens of the State should collect and dry digitalis leaves according to specific directions, and send them to the School, transportation charges prepaid. At the School the leaves were sorted, repacked, and sent up to the College of Pharmacy at the University of Minnesota, where they were standardized and made into tincture. From this point, the preparation was sent to the Medical Department of the Army, whence it was distributed to cantonments in this country and abroad.

Digitalis is the most reliable remedy for many diseases of the heart, especially those resulting from shell shock.

Most of the shipments sent to the School were collected by children of the public schools. Two large shipments were sent to the Government, totaling over 1400 pounds of the dry leaves, or sufficient for several hundred million doses.

Respectfully submitted,

A. ZIEFLE,

Dean of the School of Pharmacy.



## REPORT OF THE SCHOOL OF VOCATIONAL EDUCATION.

To the President of the College,

Sir: In compliance with your request for a brief report on the work of the School of Vocational Education, I have to say that the organization of the School was authorized by the Board of Higher Curricula in June, 1918. The present organization, therefore, has had a very brief existence.

**Purpose and Scope.** The chief purpose of the School is to prepare teachers for the public schools in a comparatively limited field, including at present Agriculture, Commerce, Home Economics, and Industrial Arts. There are two main lines of work: (1) continuation of the training of teachers for the general high school departments in the special subjects, as conducted in this institution for the past nine years by the department of Industrial Education; (2) the training of vocational teachers to give courses under the provisions of the Smith-Hughes Law to pupils in the schools preparing for direct entrance upon a vocation.

The School will continue the first line of work and for the immediate future this will require the larger number of teachers. The practical character of the instruction in these branches is recognized and an effort made to fit the pupils in the schools to some extent for vocational demands. There are a number of difficulties in the way of attaining complete success, among which are the attitude of school officials and communities, the lack of definite standards for the content and method of instruction, the failure of the educational leaders to agree upon the place and function of vocational education in our system of public education.

The Smith-Hughes law and its Board of Administration have set up definite standards and placed specific requirements upon the states in their use of the Federal subsidies. The purpose is to provide vocational training for boys and girls of fourteen years of age and above that will fit them for immediate entrance upon an occupation. This training must be of less than college grade. The Federal appropriation must be matched dollar for dollar by the states or communities participating, or by both. There are two main lines; namely (1) Agriculture and (2) Trades and Industries, including Home Economics. The Federal Government provides separate funds for each and an additional fund for the training of teachers of these vocational branches. The State Board for Vocational Education has designated the Oregon Agricultural College as the institution in Oregon for the training of all Smith-Hughes teachers.

While this vocational training is meant to fill a gap in the present system, the fact must not be lost sight of that the majority of the boys and girls in Oregon schools will not come under its influence for some years at least. The sort of education for which the work of this institution prepares teachers has its place in a scheme of general education. In other words, the subjects of Agriculture, Household Economy, Commerce, and Industrial Arts should have a place in every school curriculum. Therefore, the work of the School of Vocational Education is broader than its title. It must be said, however, that a good part of the teacher-training may be common to both the vocational and the general education purposes.

**Federal Funds Conditional.** For the present year the Federal Government subsidy for teacher-training, all of which is available for the Oregon Agricultural College, amounts to \$5,138.91. No part of this fund can be expended without an equal appropriation by the State. Since the passage of the Smith-Hughes law by the national congress there has been no session of the Oregon Legislature. In order to make use of the teacher-training funds, it has been necessary, therefore, to duplicate the amount used with money from the College raised by the millage tax. This must be done, of course, at the expense of other projects having a prior claim. The Legislature will be asked at the 1919 session to pass a law accepting the provisions of the Smith-Hughes Law and appropriating sufficient money to match the Federal funds.

**Budget Apportionment.** The salary budget of the School for the year July 1, 1918, to June 30, 1919, submitted in the annual report last spring, shows the following apportionment of Smith-Hughes funds used in payment of the cost of training vocational teachers: Agriculture, \$1483.66; Home Economics, \$2291.25; Trades and Industries, \$1364.00.

**Teacher Training.** In the development of the courses it has been found that the instruction for Home Economics teachers can be based wholly upon Smith-Hughes standards, thus qualifying every young woman taking our course in Home Economics education for Smith-Hughes teaching positions. The training of vocational teachers in Trades and Industries is so specific that comparatively little of it can be done on the campus. These teachers must be experienced tradesmen, and recruits must therefore be found in the different trades and organized into classes for pedagogical training. Some of these will come to the campus for that training, but the large majority must be trained in itinerant schools. Such schools or courses are being conducted in the city of Portland by our department of Industrial Education. Teachers of Agriculture can be trained in the institution, and, in fact, under the Oregon standards, none but graduates of college courses in Agriculture are eligible for these teaching positions.

**Handicap of War.** The war has made serious inroads upon the work of the School. It affects the courses in Agriculture, Trades and Industries, Manual Training, and Commerce. There are about a half dozen men of mature years who are taking one or more courses with a view of preparing to teach Agriculture. There are no men students preparing to teach Trades and Industries, Manual Training, and Commerce. There are also few women to teach Commerce. An effort was made to enlist women in the courses usually taken by men, but without success during the first quarter. There is good reason to believe that immediately after the close of the war, the registration of men will not only be restored but increased. The industrial and agricultural revival will increase the demand for trained workers, and naturally these will require teachers. The program of the School should include an immediate campaign to recruit students, both women and men, for these courses. The public schools of Oregon are at present much undermanned in industrial arts and commerce teachers and the demand, which we have not heretofore fully met, will be greater than ever.

. **Teacher Appointments.** The placement of new teachers each year from the graduating class has numbered from 50 to 75 during the past three or four years. In addition, from 30 to 50 reappointments of former graduates are made annually, representing in most cases promotions. In recent years many of these appointments have been to positions in neighboring and more remote states which include those in normal schools, colleges, and universities as well as in elementary and high schools. A majority of the positions have been secured through the recommendation of the Appointment Committee, which will operate in the future through this School.

In conclusion, I have to say that the organization of the School, as effected July 1, 1918, seems to be adequate for the growth and development of the School during the biennium 1918-20.

Respectfully submitted,

E. D. RESSLER,

Dean of the School of Vocational Education.

## REPORT OF THE SERVICE DEPARTMENTS.

To the President of the College,

Sir: On September 1, 1918, eleven of the departments of the College which render instructional service to two or more schools were united into an administrative unit under the term Service Departments. The departments concerned are: Art and Architecture, Bacteriology, Botany, Chemistry, English, Entomology, History, Mathematics, Modern Languages, Physics, Zoology and Physiology. In thus grouping these various lines of instruction it is believed that there may be a fuller appreciation of the requirements of the several schools and a constant broadening and strengthening of the instructional work rendered.

**War Conditions.** Because of the establishment of a unit of the Students Army Training Corps at this institution, some reorganization of courses has been necessary. Since the regular work in most of the departments was well adapted to the requirements of war training such changes mainly involved the adaptation of the class schedules from the semester to the quarter system. One entirely new course, designed to train students for the Sanitary Corps, was instituted with success by the department of Bacteriology, assisted by the departments of Chemistry, Zoology and Physiology, and Modern Languages. Courses in War French and War Aims English were added to the regular curriculum.

**Future Outlook.** It would be premature definitely to outline future policies at this time. Naturally with changing conditions, educational as well as economic, revision of many of the courses offered becomes a necessity. The nature of such changes can be determined only after a thorough study of all phases of the problem, since some part of the work of every student in the institution would be influenced. Increasing effort should be directed toward the development of teaching from principle and the removal of instruction from the field of empiricism alone. Considering the responsibilities which graduates from some of the more technical and professional schools may be reasonably expected to assume, the suggestion that curricula requiring the equivalent of five academic years for completion be established, merits serious thought. Whether a part of this time should be spent as a graduate year, is also a matter to be investigated. But even on the present four-years basis, there is real need for liberalizing and broadening the instructional work in the immediate future. It is my firm belief that time and space can and must be found for such courses along with the more technical subjects.

At the present time most of the departments are fairly well provided with room and equipment; none is so severely handicapped that good work is an impossibility. Specific needs must be cared for as the type of work given may demand and funds are made available. It seems unnecessary to make individual recommendations at this time.

Respectfully submitted,

E. J. KRAUS,

Dean of the Service Departments.



## REPORT OF THE LIBRARIAN.

To the President of the College,

Sir: I have the honor to submit the following report of the Library for the biennium ending June 30, 1918:

**The New Library Building.** It is my pleasure to begin this report by informing you that the need and the ideal of our College are at last realized in a Library building adequate to our needs. The building is very simple and dignified as befits the one building which is the greatest source of help and inspiration to this College of vocational and scientific learning. It exemplifies in harmony of proportion and coloring and in adaptability to the library needs of the College, the art which we desire to teach our Oregon boys and girls and which can be taught effectively only by association and absorption. From its simplicity, harmony, and adaptability to service, I cannot but consider it the most artistic building on the campus.

In a pioneer College such as ours, in a State where resources are not yet largely developed, it has been necessary for the President and Board of Regents of the College and the legislators of Oregon, to consider the development of the institution as a whole. Such being the case, the Library has been administered under very hampering circumstances, and it is at the end of a long ten years' wait that we at last find ourselves furnished with a building adequate to the need of this rapidly growing College. Unfortunately, some very necessary parts are not yet finished, notably the permanent book stacks, but, owing to the war, the legislature could not appropriate the full amount for the completion of the Library, and with patience we await the time when this can be done. The book stacks are quite necessary, since at present our loan desk assistants are obliged to carry many of the books needed up and down the stairs, a service which should not be required of these young women.

**Size of the Library.** The library consists of 35,814 catalogued volumes, 664 uncatalogued, 4463 U. S. government documents, 6400 State documents, 1858 catalogued pamphlets and about 40,000 uncatalogued. The library subscribes for 463 periodicals, chiefly scientific and technical. We receive as gifts, subscriptions to 110 periodicals. The library has noted with appreciation that in spite of the great increase in cost of publication during the war, very few of the agricultural periodicals have withdrawn their gift subscription to the College.

**Library Staff.** The library staff consists of the Librarian and seven assistants, two of the latter, the order clerk and stenographer, working only half time. There is in addition a library page whose work does not exceed three hours a day. Our additional work at the library loan desk requires greater help than usual. This can be furnished, I think, by additional library-page service instead of a regular librarian. Formerly our page requirement has been for \$250.00 a year; but this year, besides our usual page help in putting away books and doing other mechanical work, we shall have to have additional page help to assist in waiting on the loan

desk certain hours when the work is too heavy to be cared for by one assistant. It will be cheaper and equally effective to use a page as assistant than to hire an extra library assistant. In addition to the regular staff of the library, therefore, I recommend the employment of two pages, three hours a day each, at twenty-six cents an hour. This would make the whole page assistance for the year amount to \$333.20 a year, in place of \$250.00 for former years.

In this report I should like to call your attention to the excellent proof we have received recently of the capability of our staff. During the summer the College Librarian was called upon to give service as Hospital Librarian at Camp Lewis. This threw nearly all the responsibility of the executive work of the library upon the members of the staff, especially upon Miss Lewis, Assistant Librarian, and Miss George, the head of the Continuations Department. These shouldered the added responsibility with the utmost good cheer, and carried it most satisfactorily. Aside from personal character, which cannot be discounted, I think a part of the excellent capability of our staff is due to the fact that their average of education is very high. Out of a staff of eight all but two are college graduates. Three of the staff have received from five to six years' university training which includes special library training, one other member has received a very fine library-school training. The members of the staff have had also a number of years' experience in an agricultural college library and understand requirements and values much better than less experienced members would.

At about the time the moving of the books from the old library to the new was due, the Librarian was prostrated by a serious illness and the moving had to be left in the hands of the other members of the staff. Although, owing to the classification of our library, it was not difficult to make the plans and accompanying schedules which would promote rapid and unconfused moving, it did take cool heads, executive ability, and sweet tempers to get the work accomplished as quickly and smoothly as was done. Those who moved the books were our generous faculty men, who came to the rescue of the Library when it was discovered that hired help could not be found. This moving of the library during the war year by our faculty men will remain a very interesting bit of history connected with our Library.

**Service.** The regular service of the Library consists in the circulation of books, reference work for students and faculty, the purchase of books and other library material, and their preparation for use.

The Library is open every week day from 8:00 A. M. to 10:00 P. M., with the exception of the lunch hour each day and Saturday evenings.

Besides the regular service common to all, classes are conducted for freshmen, teaching them how to use the Library. This has been a very valuable service, and has permitted us to administer our Library with a smaller staff than could otherwise be done. During the Winter Short Course and Farmers' Week, the Librarian has given lectures on library material and how to obtain it; also lectures before the mothers attending the various courses and conferences in household economics on reading for the farm home, especially children's reading.

A considerable amount of reference work has been done for persons residing in different parts of the State. We have had a number of calls

from college librarians in different states for material outlining our course of teaching the freshmen how to use the library.

As in former years the Librarian has been called upon by the Extension Service to give lectures upon call in different parts of the State on Library material for the home, especially children's literature; whenever these lectures have been given before parent-teachers' associations, great appreciation has been expressed. Our teachers over the State seem keenly alive to the influence of reading upon the child's life.

The Library was called upon for an especial war service. The Board of Regents was asked to lend their Librarian to Camp Lewis Library as Hospital Librarian for the summer. The favor was promptly granted. This was not only a very interesting service for the Librarian, but one greatly needed at the Camp. The American Library Association has had great difficulty in finding mature, motherly women who have the requisite knowledge of books, for hospital librarians, and they expressed great appreciation of the generosity of the College in lending their Librarian to meet this need.

The Librarian spoke before the educational section of Oregon Federation of Women's Clubs and before the Pacific Northwest Library Association on the library work of our camps, especially the hospital library work.

**Salaries.** In a special report I am recommending certain increases in the salaries of members of the Library staff. There is beginning to be a dearth of trained librarians, so that salaries of librarians have risen rapidly during the last few years. Members of our staff have recently received offers from other institutions much beyond their present salaries. The women for whom I am recommending advances in salaries are all college graduates, and have served this institution until their experience here has become a special asset. If they had chosen teaching as their profession and shown the same capability as they have in their library service there is no doubt that they would be receiving much better salaries than they are at present.

It is unjust to degrade the profession of the Librarian by paying lower salaries than those of the teaching profession. The college librarian occupies one of the most vital positions in the scheme of education; but such are economic laws that we cannot keep up the necessary standard of ability and education unless we pay adequately for it.

Concerning library service and the salaries of library workers, I quote the following extract from "The New Republic" of October 26, 1918, page 360:

"Library service could be, and should be, one of the most important of public utilities. It is a flexible service; it ought to be a part of the vital process of democracy; it is a condition precedent to the general diffusion of knowledge without which the most important decisions in the State must be entrusted to minorities. It goes without saying that the library staff which is to perform this all-important democratic service must be intelligent, skillful and enthusiastic. How do we go about procuring such qualifications? By a system of scandalous underpayment. In New York City, which is served as efficiently as can be expected from an understaffed organization, we have been paying librarians at rates ranging from \$50 a month to a rate of \$150, and the Board of Estimate, though avowedly



democratic in its programme and purposes, has left these figures unchanged. Other cities pay even worse; that is the only possible excuse. There are no manual trades in the city in such a sorry case."

**Needs.** One of our chief needs is that as soon as possible the steel stacks shall be added to the new Library. As soon as practicable also the basement of the building should be completed.

The new library building makes our second and greatest need stand out imperatively. We have a beautiful and convenient new building, but, after all, the building is not the Library, it is only the house for the Library, and we are not building up our **Library** to meet the needs of the different departments. Our school is forging ahead with all the splendid energy of the western pioneer, and like all pioneers we are obliged to build from the very bottom. We have not a Library having all the necessary foundation books for the work of each department, as in older schools. Our appropriation for books and periodicals and binding should exceed that of the older schools of our rank, because of our lack of fundamental material for the different departments, and yet, since the School went on the millage-tax basis, we have not had funds assigned to exceed \$5000 any year for building up our Library and meeting all the library needs of our many rapidly growing departments. These departments cannot of necessity grow normally and substantially, as our energetic, conscientious teachers and research men feel that they should without adequate library material. How keenly our faculty feel this is manifested by their appeals to the Librarian, and I have no doubt that if their reports to your office were consulted for this especial recommendation they would show vividly how our faculty feel this need for additional library material. We are on the eve also of great reconstruction in many departments of education, especially engineering and all phases of industrial education. Almost a new literature in many departments will appear within the next two or three years. This need can only be met by added funds.

Every hour spent in our beautiful new building but emphasizes the desire to make it a reality and not a show, a house whose greatest beauty lies not in its proportions and coloring, but in the knowledge which its shelves furnish to make this College what it desires and aims to be, the best institution in the State for building up a practical and broadly educated young manhood and womanhood.

It is not possible to meet our library needs in a manner at all adequate to the legitimate demands, on a sum less than \$10,000 a year.

This report consists largely in requests for additional funds, but it is perfectly evident to any business man that such an institution as the library of an active, effective, growing college, especially of a scientific nature, cannot meet the demands of its situation without adequate funds. I have therefore ventured to call your attention to our needs in such detail as to give you a clear view of them.

Respectfully submitted,

IDA A. KIDDER,

Librarian.



## REPORT OF THE DEPARTMENT OF PHYSICAL EDUCATION FOR MEN.

To the President of the College,

Sir: I have the honor to submit the following report of the work and plans of the Department of Physical Education for Men.

Physical Education in the Oregon Agricultural College includes:

1. Gymnastics, Individual and class Instruction.
2. Athletics, Intercollegiate and Intramural.
3. Physical Examinations.
4. Therapeutic (corrective) Exercises.
5. Hygiene.
6. Teacher's courses in Physical Education.

The main policy is the development of a system that has in mind the general participation of all students in the various activities for the purposes of developing organic vigor and conserving health.

The number of men students registered in the department for required and voluntary work and attending regularly is as follows:

1916-17—1st semester .....	1125		
2nd semester .....	832	(war conditions)	
1917-18—1st semester .....	684	"	"
2nd semester .....	530	"	"

The Health Service Department and the Department of Physical Education made arrangements for conducting health examinations of all the men in the College.

During the year 1917-18 two hundred and thirty men reported regularly for medical gymnastic treatment—for the correction of various physical defects.

Athletic sports and contests have been the chief feature of the system of physical training. Physical exercise is best accomplished through sports of all kinds and these sports are the most exhilarating and consequently the more profitable when the spirit of competition is introduced.

Intramural athletics has been developed on a large scale until now ninety percent of the students participate regularly in some form of competition. The students now recognize the graduations of athletic achievements and honors through the various organized groups; namely, inter-fraternity, club and independent leagues, inter-military company, inter-school, inter-class by school, and inter-class and inter-collegiate squads. The inter-collegiate teams are made up principally of students who have passed through the intra-mural degrees of development.

We regard inter-collegiate athletics as a legitimate form of athletics for the students and as occupying a place in the undergraduate life. By designating coaches officially as members of the faculty with faculty titles and with responsibility to the College and student body like that of any other teacher, we are giving notice that we regard inter-collegiate athletics as an incidental part of our general scheme of physical education.

The College is adequately equipped for all forms of outdoor athletics. The gymnasium building provides ample space for all indoor activities, but much of the work is ineffectively carried on on account of inadequate facilities. There is great need for gymnasium and wrestling mats, apparatus, lockers, and a drying room. The unfurnished rooms now used regularly for departmental work should be completed and furnished to meet the needs of the men. No system of physical education is complete without a swimming pool, and the students of O. A. C. are deserving of a pool that will be adequate for teaching swimming to all and conducting an extensive program of aquatic activities.

Respectfully submitted,

A. D. BROWNE,

Director.

## REPORT OF THE DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

To the President of the College,

Sir: I submit to you the following report of the department of Physical Education for Women.

**Aims of the Department.** The aims of the department are primarily to care for the physical well-being of the average normal college woman, although special attention is given the abnormal case as far as is consistent with the other work of the department.

The aims in general may be classified as—

1. Upbuilding of general health.
2. Maintaining of bodily vigor.
3. Strengthening of vital organs.
4. Detection and correction of postural defects.
5. Detection of other physical defects, accompanied with advice as to the need of medical attention.
6. Teaching of proper care of the body.
7. Teaching of principles of team play, true sportsmanship, and cooperation.
8. Acquiring of womanly grace.

**Scope of Work.** For the attainment of the aims of the department various lines of work are taken up. If the bill now before the Legislature calling for physical education in all Oregon public schools passes, there will be a great demand for teachers who are also physical instructors. Young women will apply to this department for special training, and there should be added to the courses a normal training department to meet this demand.

At present the scope of work includes—

1. Practical Gymnastics.
2. Corrective Gymnastics.
3. Physical Examinations.
4. Medical Examinations.
5. Hygiene Lectures.
6. Athletics.
7. Dancing.
8. Sports.
9. Theory Classes.

**Enrollment.** The enrollment for each of the four semesters of the biennium is as follows:

	1916-17	1917-18
First Semester .....	464	573
Second Semester .....	523	564

**Prescribed Work of the Department.** A physical and medical examination is given to each student, with the assistance of the Health Service; classification for work is made from these examinations. Instead of taking countless and tiresome measurements, the department inquires into the personal physical habits of the students. They are questioned as to hours spent in sleep, exercise, study, habits of eating, drinking, etc. Personal conferences and follow-up work give these examinations practical value.

An hour's exercise daily is the ideal to be attained, but under present conditions involving long hours of laboratory work on the part of our students, the practical requirements for all young women are two hours a week spent in general activities, chosen from dancing, swimming, athletics, and games. In addition, all first- and second-year students are required to spend two hours a week in classes of practical, formal, or corrective gymnastics, according to their physical needs.

A system of inter-class, inter-sorority, inter-campus and town, and inter-dormitory games in the various sports is being fostered to arouse a more general interest in women's athletics, to replace the more highly specialized inter-collegiate games which train the few to the exclusion of the many.

**Needs of the Department.** (1) An extra floor large enough for team games is very badly needed for three reasons: First, so that basket ball, volley ball, captain ball, and many other games can be offered in a sufficient number of classes to meet the urgent demands of the greatly increased number of women; second, so that the esthetic and folk-dancing classes, which are now crowded into a small, poorly ventilated room in the basement, can be offered to the large number of students who really desire such training; third, so that there will be a place for classes in light gymnastics for those whose physical condition is such that they cannot stand the work in general gymnastic classes but whose posture does not demand special corrective work. These students represent no small percentage of our enrollment, and they are now necessarily neglected, to a large extent, on account of crowded conditions; since the main gymnasium floor is in almost constant use for general gymnastic classes.

(2) In the way of apparatus three or four Swedish booms are needed quite urgently. The boom is a large piece of apparatus accommodating a considerable number of class members at a time. While a great deal of gymnastic apparatus is too strenuous for the average college woman, there is no one piece so universally adaptable to so many forms of exercise for women as the Swedish boom.

(3) The shower bath facilities are entirely inadequate for the large number of students. A gymnasium should be a health center, giving a positive impetus to hygienic living. This cannot be done when there is constant congestion in the bathing quarters.



(4) A swimming pool, exclusively for women, is one of the big needs here. Enthusiasm runs so high that the twenty-four classes each week are undesirably large in spite of the fact that the pool is very small, dark, and unhygienic, and conveniences practically nothing at all. Since the pool has been given over exclusively to the women, many more women are swimming and many more would come out for this important training if there were only room for them.

Respectfully submitted,

MABEL LEE,

Professor of Physical Education for Women.

## REPORT OF DEAN OF WOMEN.

To the President of the College,

Sir: I have the honor to submit herewith a report of the work of the Dean of Women for the past biennium. I am also including a statement of needs and plans for future development.

**Original Policies Continued.** The work of this department for the year 1916-17 was carried out on the lines planned for 1915-16. The time devoted to the work as chairman of the Executive Committee of Home Economics was so great that it quite overshadowed the work of Dean of Women; hence it seemed inexpedient to continue that work after 1916. With this change, it became possible for the Dean of Women to do much more intensive work with the young women and more nearly to develop the ideals which had been set as a goal. The work of the past biennium has been administrative, academic, social, advisory, and supervisory in character.

**Administrative Duties.** The administrative duties included the work on committees such as the Scholarship Committee, the Student Affairs Committee, the Employment Bureau for the girls, the Advisory Board of the Young Women's Christian Association, the Bible Study Committee, the Executive Board of the Women's League, the Clara H. Waldo Committee, Forum Committee, and the Pan Hellenic. The work of the Scholarship Committee is valuable in that it enables the Dean of Women to assist the weak student and to incite the indolent to greater effort, and incidentally to discover the cause of deficiencies. The work on the Student Affairs Committee aims to furnish the Dean of Women an opportunity to establish her ideals of a sane and refined but simple social life on the campus; to permit her to provide sufficient social relaxation over the week-ends to keep the students contented. So far as possible, it has been carried out according to the students' point of view. All social affairs have been carefully supervised and properly chaperoned.

**Employment Bureau.** By request of the National Young Women's Christian Association, the Bureau of Employment was turned over to the office of the Dean of Women in the spring of 1918. Up to date this year, employment has been found for over fifty young women, nineteen of whom are working in private families. At the rate of working three hours a day, in return for room and board, they would be giving 3800 hours of time, while at the rate of thirty cents an hour they would earn \$1140. Over fifty are working at various kinds of occupations, including care of children, laundry work, washing dishes, general house work, clerical work, clerking, work in telephone offices, banks, theme correcting, and waiting on tables in the halls of residence. Many hundreds of hours of time are being given by these busy young women to earning part of their expenses while in College.

**Academic Work.** The academic work includes the teaching of Personal Hygiene to 260 girls through a lecture once a week. Perhaps the

most important part of the academic work is covered by the personal conferences which girls seek in connection with the arrangement of their courses and the amount of credits to carry.

**Social Activities.** The social life of the students is wholesome and not excessive. The most painstaking care is exercised to assist in every way to provide the young people with just what is needed and best for them in their social diversions. A high standard is maintained. During the period of the war the social life has been of the very simplest, no refreshments of any kind being served.

**Advisory Relationships.** Obviously, the most vital and valuable part of the work of this office cannot be put into a report—the advisory relation of the Dean to the girls. Many hundreds of personal confidential and group conferences have been held during the past biennium—talks on innumerable subjects to all groups have been given. During the past biennium, the advisory work of this office has been much intensified. Practically all the young women come frequently for advice and suggestions on varied subjects. The past year this particular work has extended to the men. They have sought the help of the Dean of Women in various ways; she was asked to speak in every fraternity house and club and before the entire student body of men on various subjects of special interest to them. This opportunity of getting in touch with the men has been of great aid in increasing influence in matters of conduct and social life on the campus as a whole; and has resulted in an ideal condition of cooperation and understanding on all matters of interest to men and women alike. Bible and leadership classes have been conducted, and plans for organizations presented with gratifying results in the growth and steady progress of the young women in many directions.

**The Women's League.** The Women's League formed in 1916 has progressed and has afforded opportunities for the girls in leadership and initiative. Concerted war work was carried on by means of this organization. Nearly all the young women took the courses in First Aid and many contributed generously to all war activities, bought Liberty Bonds, War Stamps, and gave money to French orphans and Belgian children.

**Sororities.** The Greek letter organizations on the campus have made steady and most satisfactory growth. Though we had only one national sorority in 1915 we have now seven national and four local organizations. Through the local Pan Hellenic, these groups are conducted most sanely and carefully. They are doing much to help our housing problem. In the fall of 1917, the large enrollment of young women could not have been properly cared for if it had not been possible to allow two sorority groups at the time of registration to move into houses. Waldo and Cauthorn Halls were crowded to their utmost capacity even after these two groups moved out. These organizations on our campus stand for scholarship, democracy, and loyal support to the College which makes their existence possible. A Grand Officer of one of the national sororities when a visitor on the campus recently, declared that the sorority conditions here were the best she had ever seen. This desirable condition is due to the splendid spirit of cooperation and democracy evidenced by the members who constitute these groups.

**Down Town Girls' Club.** Another organization which has developed greatly during the past biennium is the Down Town College Girls' Club. From a very small beginning this club has grown until over one hundred girls have attended the meetings. This organization is doing a great deal to create coordination and cooperation between the work and life of the girls on the campus and off.

**Advisory and Supervisory Work.** The advisory and supervisory work of the office is carried on through personal interviews with all girls; through calls on the town girls and those who are residing outside of the halls in order to earn their living; through frequent meetings, large and small; and through participating whenever possible in all the social affairs of the men and women. Conferences were held with all the Seniors and Juniors last spring in order to urge them to spread the gospel of the value of a college education amongst their high school friends at home. The correspondence includes letters to all prospective women students, and during the year, to many anxious mothers, and to girls who have attended College before but have not returned. Many letters of recommendation have been written and letters of inquiry on various subjects answered.

**Loyalty of Women.** Owing to the establishment of the S. A. T. C. on the campus and the serious epidemic this fall, many of the plans for the further development of the work of this department have been delayed. The splendid spirit which all the young women showed under the trying days of change of residence, owing to the taking over of the women's gymnasium and halls of residence by the Government for the men, indicates their great loyalty to country and college.

**Addresses.** Contact with people of the State has been gained by numerous addresses in Portland and elsewhere before the Association of Collegiate Alumnae, the Oregon Federation of Women's Clubs, Parent-Teachers' Associations, Welfare Club, National Educational Association, Conference of Women Deans, all the high schools of Portland and other high schools of the State.

### NEEDS.

**Housing.** The emergency which has placed the women in halls in small groups has made several facts clear, the chief of which is that the small group system when the groups are scattered is fatal to the democratic spirit which we guard so jealously—each group is more homelike but interchange between the groups at such distances is almost impossible under the busy life the girls lead. Waldo and Cauthorn Halls have filled a great need on the campus, but they should be fitted up for the men **not in organizations**, under the direct supervision of a Dean of Men—but **not until** we can have for the women halls of residence on the unit plan on the campus. Such halls should be built for the women as soon as possible if our enrollment of women is to increase as we desire it to increase.

**Woman's Building.** As stated in my 1915 report, the greatest need on the campus for the women is a woman's building which should contain an assembly room for the women's use, social parlors, the Dean of Women's offices, rest and study and committee rooms.



The women should have a swimming pool for their **sole** use.

**Faculty and Students.** In my last report, I stated that I thought there was need of more personal and social contact between faculty and students. This need still exists. A little time taken for recreation on the part of the faculty inevitably leads to higher efficiency and produces better understanding between teacher and student.

**Future Development.** The opportunities and responsibilities of the department of a Dean of Women are so limitless that it is impossible to outline definite plans for future development. Suffice it to say that the ideal is to direct all efforts toward the finest development of true womanhood and leadership; to advise women in the selecting of their work so that they may best be prepared to serve wherever they may be placed, and to assist in every possible way to secure the best welfare of the students as a whole, and to aid in the highest development of our College in every regard.

Respectfully submitted,

MARY E. FAWCETT,

Dean of Women.

## REPORT OF THE COLLEGE HEALTH SERVICE

To the President of the College,

Sir: The College Health Service, established in 1916, is maintained by funds derived from regular student fees, twenty-five percent of such fees being devoted to this purpose. The service, in normal times, comprises a Medical Adviser, with headquarters at the Health Service Building and a resident graduate nurse, who is in attendance at the same building. The aim of the service is to promote the health of all the students. This aim is sought through medical examination, through consultation during office hours, through attendance of the Medical Adviser upon those in hospital and those ill at their residences, through sanitary inspection and through supervision in case of epidemics. The service is free to all students, except as each contributes to the fund through the general fee paid to the College at Registration.

For the year 1916-17 the Health Service received 7,400 office calls, made 541 home calls, and treated 2,900 cases. The average number of treatments for each case was less than 3, the greatest number was 71. For the year 1917-18 no complete report is available. Between January 1, 1918, and April 15, the date the Medical Adviser left for war service, he had treated over 4,000 cases and made an average of 30 house calls per month. He had performed 30 operations for the removal of tonsils and 75 other minor operations. In addition he made 300 army medical examinations and many examinations for the civil service.

The College Health Service for the first term of the college year 1918-19 was divided between the S. A. T. C., under whose auspices the men were cared for, and the regular College Health Service, under the immediate charge of a Resident Nurse, who devoted her attention almost exclusively to the women students of the College. The regular Medical Adviser, on leave of absence in war work, had died in service October 13, 1918.

The facts of this report, therefore, are compiled from (1) the Report of the Commanding Officer, S. A. T. C., Oregon Agricultural College, to the Adjutant General U. S. A., (2) the Report of the local Contract Surgeon of the S. A. T. C., and (3) the Report of the Resident Nurse of the College Health Service. All these reports cover the same period; namely, from October 1 to December 31, 1918.

The Resident Nurse, ministering especially to women students, with headquarters on the ground floor of the Home Economics Building, held consultation hours, attended the sick at their residences, and referred to local physicians such cases as needed special medical attention. Between October 1 and December 31, 1918, she received 1,400 calls from women,\* paid 207 visits to the sick, and referred 234 cases to local physicians. Among the cases reported were 159 of Spanish influenza, 1 pneumonia, 2 mumps, 7 tonsillitis, 16 bronchitis, 2 lagrippe, 202 coryza, and 2 appendicitis, besides burns, sprains, indigestion, constipation,

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\*There were seven additional calls from men students.

hives, etc. Most of the work done by the resident nurse was prophylactic, seeking to prevent the development of disease. So successful was her effort in this regard, combined with cooperative efforts in instructing students how to detect the symptoms of disease, especially influenza, and to guard against it, that in spite of the general prevalence of influenza and the actual development of a considerable number of cases among College women, no deaths occurred among women students at the College throughout the fall term.

At the opening of College on October 1, eight physicians of Corvallis and neighboring cities were engaged to conduct the necessary physical examinations preliminary to the induction of men students into the S. A. T. C. In cooperation with the Medical Officer and the Dentist, stationed here with the detachments of U. S. troops, these physicians looked after the health of the men students during the opening days of College. Physical examinations were conducted in the Forestry building, but the headquarters of the Medical and Dental officers was in the Health Service building, and remained there throughout the fall term.

When the influenza epidemic became manifest in the S. A. T. C. the College authorities cooperated with the military authorities in a rigorous effort to control it. The third floor of Waldo Hall used as barracks for men was converted into a hospital. Rigorous inspection of companies to single out those who showed signs of sickness, segregation of the sick with careful nursing, instructions to all students in preventive and precautionary measures, the establishment of prophylactic supply stations for men and for women, and the prohibition of all general meetings where people might congregate and spread the infection, were among the steps taken to curb the epidemic. In spite of precautions, during the second week of the College term the number of cases ran close to two hundred. An urgent appeal to Military Headquarters for expert medical assistance in handling influenza resulted in the assignment to the College of Major Charles Cross, M. D., who arrived from California on October 17. That night Major Cross telegraphed the Department Surgeon, Western Department, requesting complete equipment for a military hospital to supply the emergency hospital provided in Waldo Hall. He introduced his telegram with the following statement:

"Epidemic appears well in hand and improving daily. Total yesterday one hundred ninety-five cases. Today one hundred thirty-nine, of which ninety-six are sick in hospital, forty-three sick in quarters. No deaths so far. Two cases seriously ill. One case pneumonia, fifth day, and doing well. Patients housed and treated under excellent emergency conditions."

With the assistance of Major Cross and the devoted and efficient cooperation of the physicians of Corvallis, who put their services at the disposal of the S. A. T. C. throughout the entire period of danger, conditions were skillfully handled.

The situation as a whole is admirably summed up in the Report of Colonel Alred C. Sharpe, Commanding Officer, who says:

"The influenza epidemic resulted in a total of 785 cases. The top floor of Waldo Hall was set aside for a hospital and placed under charge

of Contract Surgeon Bosworth, and the necessary nurses. Every precaution was taken by segregation and quarantine to check the spread of the disease, with the result that it was soon under control and by November 15th had entirely disappeared. The precautions taken and the careful nursing no doubt may be credited with the small percentage of deaths, a total of 4 out of 785 cases."

From the final report of the Medical Department, S. A. T. C., Oregon Agricultural College, I quote the following, which completes the period of the S. A. T. C. following the departure of Major Cross, who came merely to assist in an emergency:

"The Medical Department has been in command of Contract Surgeon R. L. Bosworth since November 7, 1918, assisted by Contract Surgeon E. W. Howard, and Enlisted Personnel of eleven men including 1 Sergeant, 5 Privates, and 5 Hospital Orderlies.

"A Post Infirmary has been maintained continually, which has been open to receive patients from 7 a. m. to 8 p. m. daily. A night orderly has been quartered at the Infirmary to handle emergency cases. An average of sixty patients daily has been cared for.

"A Thirty-bed Hospital on third floor of Waldo Hall Barracks has been maintained to care for all medical and surgical bed cases. This Hospital has been running to capacity practically all the time, employing from 2 to 12 graduate nurses besides 6 hospital orderlies. An efficient diet kitchen has also been maintained in connection.

"The sanitation conditions have been of the best, special attention being given to ventilation, heating, and sewerage. An incinerator has been in operation for the disposition of waste. All Barracks have been steam heated, electric lighted, well ventilated, and equipped with modern sanitary plumbing."

In a word the influenza situation for the period covered by this report is summed up in the statement of Major Cross, in a public address just before his departure, when he declared that the epidemic had been more successfully controlled at the Oregon Agricultural College than at any center of military training in the country where an equal number of men were concerned.

Respectfully submitted,

U. G. DUBACH,  
Chairman Board of Control.



## REPORT OF THE REGISTRAR.

To the President of the College,

Sir: As Registrar, I submit herewith my report covering the two College years of 1916-17 and 1917-18. The data tables are divided into four parts as follows:

- Part 1. Student Enrollment.
- Part 2. Composition of the Student Body.
- Part 3. Courses Offered.
- Part 4. Degrees Conferred.

### PART I. ENROLLMENT.

The enrollment statistics as given in all tables take account only of resident instruction, there being no enumeration of correspondence courses, extension and itinerary schools, etc.

**Table 1. Comparison of Enrollment by Sex.**

Schools	1916-17			1917-18		
	Men	Women	Total	Men	Women	Total
Agriculture .....	569	7	576	419	6	425
Commerce .....	149	63	212	112	186	298
Engineering .....	364	1	365	318	1	319
Forestry .....	85	...	85	59	1	60
Home Economics .....	...	412	412	...	413	413
Pharmacy .....	57	6	63	44	24	68
Optional .....	8	53	61	3	24	27
Music .....	16	31	47	16	42	58
(Summer School						
Short Courses .....	1,146	831	1,977	1,065	720	1,785
Totals .....	2,394	1,404	3,798	2,036	1,417	3,453

It will be noted that the total enrollment for the second year of the biennium is slightly less than the total for the first year, the decrease in the short courses amounting to 192 and the decrease in the long course enrollment totalling 152. The depletion of the colleges generally throughout the country began with the Mexican trouble in the spring of 1917. Before commencement of that school year scores of high school and college students rushed into military service with the enrollment results as indicated above.

The details of the loss or gain by departments, as shown above, indicate that the loss in Engineering, Forestry, and Optional students lacks only two of being off-set by the gain in the schools of Commerce, Home Economics, Pharmacy, and Music, the largest individual loss being in the school of Agriculture, which was most affected by the great labor shortage at that time.

The demands for men in the Army, in industrial plants, and on the farms became so insistent in the spring of 1917 that 672 students withdrew before commencement of that year. College officials considered the cause of withdrawal for these purposes so justifiable that proportional credits for the semester's work were given those students who

withdrew for military reasons or to enter those industrial enterprises necessary to the maintenance of the Army. The freshman class alone of 1916-17 lost more than two hundred members by reason of such withdrawal. Both the sophomore and junior classes lost more than one hundred members each. The total withdrawals for the two years were as follows:

**Table 2. Withdrawals from College for Military or Industrial Reasons.**

	Army 1916-17	Industrial 1916-17	Total 1916-17	Army 1917-18	Industrial 1917-18	Total 1917-18
Freshmen .....	26	194	220	25	67	92
Sophomores .....	32	117	149	39	46	85
Juniors .....	39	70	109	29	22	51
Seniors .....	40	52	92	52	28	80
Graduates .....	3	11	14	3	1	4
Vocational and Optional .....	28	60	88	13	37	50
Totals .....	168	504	672	161	201	362

During the two years of the biennium the relative number of women registered in long courses increased materially. Exclusive of the course in Home Economics given primarily for women there were 161 registered in 1916-17 and 284 in 1917-18.

**Table 3. In Courses Other Than Home Economics, Women Were Registered as Follows:**

	1916-17	1917-18
Agriculture .....	7	6
Commerce .....	63	186
Engineering .....	1	1
Forestry .....	1	1
Pharmacy .....	6	24
Optional .....	53	24
Music .....	31	42
Total .....	161	284

In connection with Table 4, showing the comparison for the two years by classes it is worthy of special note that in spite of the large number of students who withdrew for military reasons in 1916-17, as shown by Table 2, the enrollment in both the freshman and sophomore classes for 1917-18 exceeded the enrollment for those same classes in 1916-17.

**Table 4. Comparison of Enrollment by Classes.**

	1916-17	1917-18
Vocational .....	126	71
Freshman .....	565	584
Sophomore .....	366	383
Junior .....	239	223
Senior .....	211	180
Graduate .....	56	20
Special .....	150	122
Optional .....	61	27
Music .....	47	58
Short Courses .....	1,977	1,785
Total .....	3,798	3,453

## PART II. COMPOSITION OF THE STUDENT BODY.

The information relating to the composition of the Student Body as shown in the following five tables is derived from answers given by

students to various questions printed on the registration cards. It indicates broadly our constituency geographically, economically, and scholastically.

Table 5. Geographical Distribution of Students.

A Oregon Counties	1916-17			1917-18		
	Long Courses	Short Courses	Total	Long Courses	Short Courses	Total
Baker .....	21	5	26	21	8	29
Benton .....	314	724	1,038	302	706	1,008
Clackamas .....	34	28	62	39	32	71
Clatsop .....	26	7	33	20	10	30
Columbia .....	13	10	23	12	9	21
Coos .....	22	44	66	26	37	63
Crook .....	11	13	24	5	6	11
Curry .....	1	3	4	6	4	10
Deschutes .....	..	..	..	2	15	17
Douglas .....	37	34	71	32	20	52
Gilliam .....	5	7	12	5	5	10
Grant .....	4	1	5	6	1	7
Harney .....	5	4	9	4	3	7
Hood River .....	20	19	39	11	8	19
Jackson .....	38	29	67	31	15	46
Jefferson .....	..	..	..	..	11	11
Josephine .....	18	23	41	17	11	28
Klamath .....	14	7	21	17	5	22
Lake .....	3	3	6	3	1	4
Lane .....	44	94	138	34	65	99
Lincoln .....	11	10	21	9	13	22
Linn .....	55	167	222	56	168	224
Malheur .....	7	7	14	25	8	33
Marion .....	83	121	204	84	93	177
Morrow .....	5	18	23	2	6	8
Multnomah .....	271	172	443	288	128	416
Polk .....	40	69	109	30	60	90
Sherman .....	5	15	20	6	10	16
Tillamook .....	10	18	28	6	7	13
Umatilla .....	38	24	62	35	24	59
Union .....	31	14	45	24	13	37
Wallowa .....	4	5	9	3	5	8
Wasco .....	8	45	53	17	43	60
Washington .....	32	60	92	25	55	80
Wheeler .....	1	2	3	3	2	5
Yamhill .....	40	63	103	31	42	73
Totals .....	1,271	1,865	3,136	1,237	1,649	2,886

Geographical Distribution of Students.—Continued.

B Other States	1916-17			1917-18		
	Long Courses	Short Courses	Total	Long Courses	Short Courses	Total
Alaska .....	9	1	10	1	..	1
Arizona .....	1	4	5	1	..	1
California .....	177	28	205	149	40	189
Colorado .....	7	3	10	6	..	6
Connecticut .....	1	..	1	..	..	..
District of Columbia .....	..	..	..	3	..	3
Hawaii .....	3	..	3	2	..	2
Idaho .....	46	4	50	40	16	56
Illinois .....	18	2	20	9	..	9
Indiana .....	7	..	7	5	2	7
Iowa .....	7	2	9	3	1	4
Kansas .....	6	..	6	8	1	9
Maine .....	3	..	3	..	..	..
Maryland .....	2	..	2	..	..	..
Massachusetts .....	4	1	5	..	..	..
Michigan .....	2	..	2	5	5	10
Minnesota .....	4	2	6	4	..	4
Missouri .....	1	..	1	1	1	2
Montana .....	18	3	21	13	4	17

Nebraska .....	5	..	3	3	6
Nevada .....	3	..	1	1	2
New Hampshire .....	1	..	1	1	2
New Jersey .....	1	..	..	..	..
New York .....	4	..	6	..	6
North Carolina .....	..	..	1	..	1
North Dakota .....	1	3	3	6	9
Ohio .....	8	1	9	8	13
Oklahoma .....	6	..	6	2	3
Pennsylvania .....	5	..	5	..	6
Philippine Islands .....	..	..	3	..	3
South Dakota .....	2	..	4	1	3
Tennessee .....	1	..	1	..	..
Texas .....	2	..	1	..	1
Utah .....	5	1	6	2	2
Vermont .....	..	..	..	1	1
Washington .....	147	43	191	198	149
West Virginia .....	1	..	1	..	..
Wisconsin .....	3	..	3	1	4
Wyoming .....	1	..	1	3	3
Totals .....	512	99	611	405	536

## Geographical Distribution of Students.—Continued.

	1916-17			1917-18		
	Long Courses	Short Courses	Total	Long Courses	Short Courses	Total
Foreign Countries .....	..	..	..	..	..	..
Australia .....	1	..	1	..	..	..
Canada .....	9	9	18	11	5	16
China .....	2	1	3	5	..	5
Denmark .....	1	..	1	..	..	..
England .....	3	1	4	..	..	..
Finland .....	1	..	1	..	..	..
Germany .....	1	..	1	..	..	..
Ireland .....	..	..	..	1	..	1
India .....	11	2	13	4	..	4
Japan .....	2	..	2	..	..	..
Nicaragua .....	1	..	1	..	..	..
Norway .....	1	..	1	..	..	..
Russia .....	2	..	2	..	..	..
Scotland .....	1	..	1	1	..	1
Argentina .....	1	..	1	1	..	1
Sweden .....	1	..	1	2	..	2
Turkey .....	..	..	..	1	..	1
Totals .....	38	13	51	26	5	31
Summary .....	1916-17			1917-18		
36 Oregon Counties .....	2,126			2,886		
33 Other States .....	611			536		
17 Foreign Countries .....	51			31		
Totals .....	3,798			3,453		

The democratic spirit manifested by students at the Oregon Agricultural College has come to be one of the distinguishing characteristics of the student body. There are two factors in particular which have tended to bring about and encourage this spirit of democracy. These are Student Self Support and Student Self Government. For several years Student Self Government on the campus has been a demonstrated success. For several years also a large percentage of our student body has been partly or wholly self supporting. As shown by Table 6, 81 percent of the entire student body was partly or wholly self supporting in 1916-17 and 77 percent in 1917-18.



Table 6. Student Self Support.

	Percent of Student Body	
	1916-17	1917-18
	%	%
Entirely self supporting .....	42	39
One-half self supporting .....	27	27
Partly (less than half) self supporting.....	12	11
Not at all self supporting.....	19	23
Totals .....	100	100

Table 7. Occupation of Parents or Guardians.

SUMMARY	1916-17	1917-18
Agriculture .....	491	518
Railroading .....	14	15
Mercantile .....	103	108
Miscellaneous business .....	219	277
Business Management .....	6	8
Financial and semi-legal .....	47	42
Manufacturing .....	6	9
Government service .....	30	25
Artistic professions .....	2	3
Scientific .....	1	1
Professions .....	75	80
Retired .....	145	111
Unskilled labor .....	125	130
Skilled labor .....	161	165
Not given .....	396	176
Totals .....	1,821	1,668

Table 8. Ages of Students.

	1916-17	1917-18
Average age of men.....	19	20
Average age of women .....	20	19

Table 9. Schools From Which New Students Were Received.

OREGON	1916-17	1917-18
157 High Schools .....	508	515
26 Colleges or Universities.....	33	39
OTHER STATES		
29 High Schools .....	227	185
27 Colleges or Universities .....	85	71
FOREIGN COUNTRIES		
7 High Schools .....	9	9
2 Colleges or Universities .....	3	1
Totals .....	865	820
193 High Schools .....	744	709
55 Colleges or Universities.....	121	111
Totals .....	865	820

## PART III. COURSES OFFERED.

Part III shows the number of courses offered in the College in the various schools and departments. It should be noted especially that the figures of these tables do not in any way afford a basis for comparison of the instructional work of the several departments for the reason that each course listed in the Catalogue is here counted as one course regardless of whether that course is given one, three, or five times a week or whether it continues through one or both semesters of the college year. The tables do serve, however, to indicate the scope of

the work of various schools and departments. The different full year courses offered during the biennium total 755 in 1916-17 and 767 in 1917-18. Of this total the school of Agriculture offered the largest number with an average of 218 different courses for each of the two years. Engineering ranked second with an average of 133 courses each year.

Table 10. Summary of Courses Offered.

Schools or Departments	Long Courses		Sum. Sch. and Short Courses		Totals	
	16-17	17-18	16-17	17-18	16-17	17-18
Agriculture	215	221	3	12	218	233
Commerce	70	70	12	12	82	82
Engineering	132	135	22	15	154	150
Forestry	34	36	*	*	34	36
Home Economics	37	35	18	18	55	53
Mines	41	41	*	*	41	41
Pharmacy	30	30	..	..	30	30
Service Departments	196	199	19	29	215	228
Winter Short Courses	..	..	506	424	506	424
Totals	755	767	580	510	1 335	1,277

## PART IV. DEGREES CONFERRED.

During the biennium the College offered the Bachelor of Science Degree in 32 different departments, Master of Science Degrees in 19 different departments, advanced Engineering Degree in 9 different departments, and a Graduate of Pharmacy Degree in one department. In addition to these, short-course certificates were offered in 8 departments and a diploma in the School of Music, making in all 70 departments offering the Baccalaureate and the advanced degrees, certificates, and diploma.

Table 11. Degrees Conferred and Certificates Granted.

	1916-17	1917-18
Master of Science:		
Agriculture	8	3
Home Economics	..	2
Electrical Engineer	1	5
Bachelor of Science:		
Agriculture	77	54
Commerce	25	12
Engineering—		
Chemical	4	1
Civil	4	2
Electrical	9	8
Highway	..	..
Industrial Arts	10	7
Irrigation	1	..
Mechanical	12	12
Mining	5	3
Forestry	6	2
Home Economics	72	64
Logging	12	5
Pharmacy	4	4
Graduate in Pharmacy	8	13
Music Diplomas	2	1
Vocational Certificates	25	23
Totals	281	216

\*The summer work in Forestry and Mining is given in the field. Practical problems are assigned the students in the forests and mines of the Northwest.

## OREGON AGRICULTURAL COLLEGE

## DISTRIBUTION OF DEGREES CONFERRED

	1916-17							1917-18						
	MS	EE	BS	PhG	Music	Voc	Total	MS	EE	BS	PhG	Music	Voc	Total
Oregon Counties(28)	7	1	177	4	1	14	204	3	125	11	1	15	155	
Other States (14)	1		54	4	1	11	71	1	46	2			6	55
Foreign Countries(6)			6				6	1	4				1	6
Totals . . . .	8	1	237	8	2	25	281	5	175	13	1	22	216	

Table 12. Graduating Classes, by Sex, 1917, 1918.

	Men	Women	Total
1916-17 .....	182	99	281
1917-18 .....	131	85	216

Table 13. Ages of Graduates, Classes 1917, 1918.

	1916-17	1917-18
Lowest .....	20	21
Highest .....	41	45
Average .....	23.9	24.8

Each year a large number of students enter the Oregon Agricultural College as transfers from other Colleges or Universities. Without considering such transfers who withdrew before graduating but listing only those who completed their courses there were 78 such transfers as members of the graduating classes during the biennium, 37, or 13 percent of the class in 1916-17, and 41, or 19 percent of the class in 1917-18.

Table 14. Members of the Graduating Class Who Transferred From Other Colleges or Universities.

	1916-17	1917-18
No. senior students entering by transfer.....	37	41
No. institutions represented .....	26	31
No. states represented other than Oregon.....	13	22
No. foreign countries .....	1	2

## JUNE, 1918—GRADUATES

## MASTER OF SCIENCE DEGREES

## AGRICULTURE

William Homer Maris, Portland, Multnomah  
Thakur Mahadeo Singh, Sultanpore, India  
Howard Marshall Wight, South Bridgton, Maine

## BACHELOR OF SCIENCE DEGREES

## AGRICULTURE

Juliette Norma Anderson, Portland, Multnomah  
Troy Bogard, Woodburn, Marion  
Roy Couch, La Grande, Union  
Jack Marion Eakins, South Pasadena, California  
John Lawrence Finney, Astoria, Clatsop  
Howard Godel, Portland, Multnomah  
Medric Greer, Dundee, Yamhill  
Homer Wallace Grow, Fairfax, Vermont  
Fred Jacoby, Toledo, Washington state  
John Mitchell Lewis, Corvallis, Benton  
James Gregory Paull, Corvallis, Benton

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Albert Hope Anis, Corvallis, Benton  
 James Daniel Baldwin, Blue Lake, California  
 Emerson Perry Black, Ferndale, California  
 Francis Gerald Bolin, Portland, Multnomah  
 Walter Carpenter, Ashland, Jackson  
 Lloyd Wilbur Coleman, Berkeley, California  
 Ralph Orval Coleman, Canby, Clackamas  
 Leo King Couch, Wallowa, Wallowa  
 Argus Harold Davidson, Meridian, Idaho  
 Eric Englund, Corvallis, Benton  
 Reuben Everett Fenner, Cadillac, Michigan  
 Chester LaVerne Firestone, Vancouver, Washington State  
 Philip Tuthill Fortner, Chicago, Illinois  
 Leaman Lee Graves, Kansas City, Kansas  
 Edwin Hartley, Marshfield, Coos  
 Leo Hollenberg, Corvallis, Benton  
 Paul Farnum Holmes, Los Angeles, California  
 Tung Ming Hung, Amoy, China  
 Ronald Ewart Jones, Brooks, Marion  
 Philip King, Portland, Multnomah  
 Walter Joseph Kocken, Cleveland, Douglas  
 Eugene Francis McCornack, Klamath Falls, Klamath  
 Cedric Stuart McMaster, Corvallis, Benton  
 Elvin Winfield McMinder, Milwaukee, Wisconsin  
 Albert Otto Meier, Hillsdale, Multnomah  
 Harold Milton Mills, Parma, Idaho  
 Frederick Washington Nestelle, Bellingham, Washington State  
 Alfred Weaver Oliver, Salem, Marion  
 Palmer Patton, Corvallis, Benton  
 Howard Clifton Ray, Roslyn, Washington State  
 Albert Roy Reber, Kansas City, Kansas  
 Albert Joseph Schoth, Oregon City, Clackamas  
 Raymond Selph, Los Angeles, California  
 Herman Al Stone, Woodburn, Marion  
 William Raymond Stow, Corvallis, Benton  
 Orson Straughan, Pendleton, Umatilla  
 Glenn Smyth Strome, Eugene, Lane  
 Benjamin Garrison Thompson, Shedd, Linn  
 Cecil Adelbert Thompson, Portland, Multnomah  
 Richard Congle Williams, Newberg, Yamhill  
 Stanley Worley, San Francisco, California  
 William SoRelle Wright, San Gabriel, California

## FORESTRY

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Oscar Byers, Portland, Multnomah  
 Harry William Elofson, Salida, Colorado

## LOGGING ENGINEERING

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Caryl Hazeltine, Oakland, California  
 Willard Johnson, Corvallis, Benton  
 Lawrence Martin McCaffrey, Corvallis, Benton  
 Charles Adelbert McCollum, Salinas, California  
 Richard Kenneth Wilmot, Portland, Multnomah

## HOME ECONOMICS

Fay Armstrong, Corvallis, Benton  
 Mary Elizabeth Barker, Oakland, California  
 Bess Barton, Puyallup, Washington State  
 Ruby Evangeline Beers, Corvallis, Benton  
 Ethel Anita Brinckerhoff, Oakland, California  
 Edith Eleanor Chandler, Kenilworth, Illinois  
 Doris Aileen Clark, Seattle, Washington State  
 Marion Bernice Forest, Portland, Multnomah  
 June Creel, Forest Grove, Washington  
 Mildred Elizabeth Crout, Portland, Multnomah  
 Helen Frances Dougherty, Baker, Baker  
 Edna May Freyler, Corvallis, Benton  
 Maren Gribskov, Junction City, Lane  
 Phila Henrietta Hall, Corvallis, Benton  
 Josephine Marion Hammond, Silverton, Marion



Marion Hodgson, Ashland, Jackson  
 Marie Katherine Howells, Medford, Jackson  
 Ruth Kelly, Portland, Multnomah  
 Inez Knowles, La Grande, Union  
 Kittie Gertrude Kyle, Corvallis, Benton  
 Dorothy Lane, Los Angeles, California  
 Hazel Claire Lankins, Hubbard, Marion  
 Gladys Loretta Legg, Portland, Multnomah  
 Annie McDonald Lindsay, Corvallis, Benton  
 Annis Love, Eugene, Lane  
 Alice McCornack, Marcola, Lane  
 Lula Litten May, Grass Valley, Sherman  
 Leta Meacham, Weiser, Idaho  
 Sophie Edis Mesher, Portland, Multnomah  
 Charlotte Elizabeth Moody, Pasadena, California  
 Myra Lucile Moore, Corvallis, Benton  
 Beulah Inez Morgan, Corvallis, Benton  
 Ruth Morton, White Salmon, Washington State  
 Martena Ruth Neal, Santa Cruz, California  
 Amy Christine Niblen, Portland, Multnomah  
 Rae Partin, Summer Lake, Lake  
 Nola Payne, Alsea, Benton  
 Mary Eleanor Pitney, Junction City, Lane  
 Nellie Irene Polson, Mt. Vernon, Washington State  
 Ada Jeannette Reed, Portland, Multnomah  
 Agnes Theresa Redmond, Portland, Multnomah  
 Mary Alice Rogers, Corvallis, Benton  
 Rena Schott, Salem, Marion  
 Bertha Lucile Shedd, Shedd, Linn  
 Elva Lourene Smith, Portland, Multnomah  
 Maude May Skidmore, Curtin, Douglas  
 Leone Adell Smith, Carnation, Washington  
 Amanda Henrietta Wagner, Laurel, Indiana  
 Eva Yates, Corvallis, Benton

#### THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR TEACHING POSITIONS

Carrie Castle, Berkeley, California  
 Wilda Counts, Grants Pass, Josephine  
 Beulah Gustavia Gilkey, Corvallis, Benton  
 Lizzie Dyson, Dahlia, Washington State  
 Emma Ione Glines, Waldport, Lincoln  
 Hallie Winifred Glines, Waldport, Lincoln  
 Ruby May McLagan, Tangent, Linn  
 Mabel Huff-Richardson, Corvallis, Benton

#### CIVIL ENGINEERING

Arthur Christ Lee Jetley, Narrows, Harney

#### THE FOLLOWING STUDENT IS ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Wilber Arthur Runyan, Portland, Multnomah

#### ELECTRICAL ENGINEERING

Clarence Krueger, Corvallis  
 Stanley Howard Myers, Corvallis, Benton  
 Conrad Walter Werth, Portland, Multnomah

#### THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Douglas Ivan Bates, Portland, Multnomah  
 Howard Wesley Cooper, Milwaukie, Clackamas  
 Glen Corey, Hood River, Hood River  
 Ernest William Louie Happold, Klondike, Sherman  
 Jesse Pimm, Corvallis, Benton

#### INDUSTRIAL ARTS

Lars John Ericson, Corvallis, Benton  
 Hiram Chester Smith, Corvallis, Benton

#### THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Melvin Hiram Ellestad, Central Point, Jackson  
 Lawrence Wallace Mack, Dufur, Wasco  
 David Nathaniel Nordling, Colton, Clackamas  
 David North, Corvallis, Benton

## MECHANICAL ENGINEERING

George Cook Carpenter, Washougal, Washington State  
 Homer Ferguson, Portland, Multnomah  
 Leroy Roland Guthrie, Corvallis, Benton  
 Bryan Towne McMinn, Portland, Multnomah  
 Ben Mason, Puyallup, Washington State  
 Francis Parker Myers, Corvallis, Benton

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Everett Willoughby Dye, Oregon City, Clackamas  
 Hugh Pillsbury Ford, Eugene, Lane  
 Neal Kelly Ford, Eugene, Lane  
 Archer Olin Leech, Corvallis, Benton  
 Jennings Bryan Lorence, Monmouth, Polk  
 Homer Blair Morris, Yamhill, Yamhill

## MINING ENGINEERING

Leaton Alanson Rice, Corvallis, Benton

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Harold Wayne Thoms, Scio, Linn  
 Joseph Marion Underwood, Pasadena, California

## CHEMICAL ENGINEERING

## THE FOLLOWING STUDENT IS ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Curtis Lee Corum, The Dalles, Wasco

## COMMERCE

Ambalal Jivabbai Contractor, Baroda, India  
 Theodore Cramer, Grants Pass, Josephine  
 Herbert Jewell, Portland, Multnomah  
 Louise Lewis, Portland, Multnomah  
 Lincoln Howard Paine, Jr., Caldwell, Idaho  
 Bertha Alice Whillock, Medford, Jackson

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE.

Lyle Blair Kiddle, Island City, Union  
 Martin O'Gara Kurtz, Corvallis, Benton  
 Clarence Scott Nesbitt, Payette, Idaho  
 Avatapalli Narayana Row, Madras City, South India  
 Leslie Stark, Holdrege, Nebraska

## PHARMACY

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

Fred Martin Curry, Albany, Linn  
 Francois Archibald Gilfillan, Delmar, Coos  
 Elmo Clayton Jory, Salem, Marion  
 Arthur James Woodcock, Portland, Multnomah

## OTHER DEGREES AND DIPLOMAS

## GRADUATE IN PHARMACY

## THE FOLLOWING STUDENTS ARE ABSENT IN INDUSTRIAL OR MILITARY SERVICE

John Barcroft, Newberg, Yamhill  
 Myrtle Esther Branstetter, Echo, Umatilla  
 Richard Eldon Carroll, Harrisburg, Linn  
 Herschel Matthew Cummins, Melba, Idaho  
 Fred Martin Curry, Albany, Linn  
 Merrill Martin Donnell, The Dalles, Wasco  
 Olin Eugene Douglas, Corvallis, Benton  
 Francois Archibald Gilfillan, Delmar, Coos  
 Chris Edward Johnson, North Powder, Union  
 Elmo Clayton Jory, Salem, Marion  
 Howard Loring Lamar, Tillamook, Tillamook  
 Fred Snowberger, Payette, Idaho  
 Arthur James Woodcock, Portland, Multnomah

## DIPLOMA, SCHOOL OF MUSIC

## ABSENT BY PERMISSION

Lucile Anna Hamlin, Corvallis, Benton

## OREGON AGRICULTURAL COLLEGE

## BACHELOR OF SCIENCE DEGREES, 1917

(Granted at end of Summer Session)

## AGRICULTURE

Georgie Rieben, Ferndale, California

## HOME ECONOMICS

Etta Adams, Corvallis, Benton  
 Ruth Marie Amesbury, Portland, Multnomah  
 Margaret Laura Davisson, Tallicum, Washington State  
 Mildred Hall, Corvallis, Benton  
 Katherine Kooker, Baker, Baker  
 Hazel Cartan Ralston, Burns, Harney  
 Iona Margaret Irving, Chicago, Illinois

## INDUSTRIAL ARTS

Raymond Louis Schoeffel, Los Angeles, California

## COMMERCE

Ivy Cecil Peterson, Kittitas, Washington State

## MASTER OF SCIENCE DEGREES, 1917

(Granted at end of Summer Session)

## HOME ECONOMICS

Linnie Currin, Talent, Jackson  
 Jane Agnes Johnston, Union, Union

## VOCATIONAL CERTIFICATES

For the successful completion of the vocational courses in Agriculture, Commerce, Dairying, Forestry, Home Making and Mechanic Arts, varying in length from one to three years, students are granted certificates which are delivered to them as the requirements are satisfied.

## AGRICULTURE

Davis John Allen, Corvallis, Benton  
 Gordon Barnard, Fossil, Wheeler  
 Alvah Cowan, Tatoosh Island, Washington State  
 John William Crow, Pendleton, Umatilla  
 Jay Rhubert Fogal, Kanorado, Kansas  
 Robin Watson Kirkland, Westham Island, B. C.  
 Walter Gibson McGinty, Davis Creek, California  
 Clark Ernest Moreland, Corvallis, Benton  
 William Francis Richards, Twin Falls, Idaho  
 John McDonald Say, Sherwood, Washington State

## HOME ECONOMICS

Margaret Alderman, Dayton, Yamhill  
 Anna Elaine Anderson, Ilwaco, Washington State  
 Erma Millicent Brook, Portland, Multnomah  
 Eunice Pern Dean, Ferndale, California  
 Margaret Derle Denny, Beaverton, Washington

## JUNE, 1917, GRADUATES

## MASTER OF SCIENCE DEGREES

## AGRICULTURE

Tracy Abell, Corvallis, Benton  
 Frank John Dietsch, Day's Creek, Douglas  
 Henry Gilbert Salem, Marion  
 Andrew Cameron McCormick, Talent, Jackson  
 John Yates McDonald, Charlestown, West Virginia  
 Harry August Schoth, Oregon City, Clackamas  
 Obil Shattuck, Corvallis, Benton  
 Clayton Strain, Pendleton, Umatilla

## DEGREE OF ELECTRICAL ENGINEER

## ELECTRICAL ENGINEERING

Willis Dhu Aine Peaslee, Portland, Multnomah

## BACHELOR OF SCIENCE DEGREES

## AGRICULTURE

Louis Carlton Acree, Berkeley, California  
 James Quincy Adams, Ashland, Jackson  
 Robert Akers, Jacksonville, Illinois  
 Frederick John Allen, Portland, Multnomah  
 Winfield Andrews, San Luis Obispo, California  
 Ralph Guile Atwood, Corvallis, Benton  
 William Samuel Averill, Corvallis, Benton  
 Edward Goodchild Axtell, Corvallis, Benton  
 Willis Arthur Bailey, Ashland, Jackson  
 Elmer Walter Bartruff, Salem, Marion  
 Vernon Basler, Grants Pass, Josephine  
 Ralph Olaf Bayley, Pittsworth, Australia  
 Edwin John Charles Bayliss, La Fayette, Yamhill  
 Julius Both, Rainier, Columbia  
 Francis Bolden Brown, Crystal, Klamath  
 Claude Clark Calkins, Dallas, Polk  
 Norval Craigie Carnie, Chicago, Illinois  
 Theodore Dwight Case, Klamath Falls, Klamath  
 William Victor Clarke, Corvallis, Benton  
 Wilbur Lawrence Close, Lawrenceville, Pennsylvania  
 Benjamin Bernard Cohen, Portland, Multnomah  
 John Raymond Croswhite, Long Beach, California  
 William Cuning, Corvallis, Benton  
 Jesse Earl Dickerson, Parma, Idaho  
 Paul Edward Doty, Pasadena, California  
 George Edwin Dunn, Ashland, Jackson  
 James Homer Edwards, Monroe, Benton  
 Arthur Ferguson, Helix, Umatilla  
 Thomas Joseph Flippin, Rainier, Columbia  
 John Morton Franklin, Seattle, Washington State  
 David Friedman, St. Charles, Illinois  
 George Merle Gragg, Monroe, Benton  
 Carl Clifford Green, Hood River, Hood River  
 Dorr Dudley Green, Parkdale, Hood River  
 Marion Allen Harrison, Brownsville, Linn  
 Joe Cephus Hawkins, Sayre, Oklahoma  
 Frank Arthur Hayes, Pasadena, California  
 William Wright Henderson, Aiea, Hawaii  
 Alton Dalrymple Hurley, Seattle, Washington State  
 Maurice Jernstedt, Carlton, Yamhill  
 Carl Stewart Johnson, Portland, Multnomah  
 Clarence Benjamin Johnson, Hermiston, Umatilla  
 William Walters Johnston, Corvallis, Benton  
 Leon Kilby Jones, Seattle, Washington State  
 Glenn Curtis Kelly, Portland, Multnomah  
 Randolph Elliott Leland, Los Angeles, California  
 Harry Vernon Levage, Florence, Lane  
 Alexander Lewis Lindsay, Hilo, Hawaii  
 Ralph William Lowry, Corvallis, Benton  
 James Douglas McKay, Portland, Multnomah  
 Alice Moore, Corvallis, Benton  
 Walter John Morgan, Portland, Multnomah  
 Frederick Allen Motz, Rock Island, Illinois  
 Andrew Edward Murneek, Los Angeles, California  
 Frank Thomas Murphy, Alhambra, California  
 Erbine Newman, Corvallis, Benton  
 Walter Burt Norton, Corvallis, Benton  
 Dunbar William Pinckney, Aberdeen, Washington State  
 John Elijah Pitman, Moneta, California  
 Ted John Porter, Halsey, Linn  
 Elmer Oren Post, Blachly, Lane  
 Hugh Milton Reynolds, Pasadena, California  
 Paul Tafel Schooley, Santa Ana, California  
 Oliver Henry Schrepel, Corvallis, Benton  
 Clarence Vincent Scott, Chicago, Illinois  
 Thakur Mahadeo Singh, Dadupore, India  
 Frank Gillette Sutherland, Honolulu, Hawaii  
 Clifford Gilbert Tarner, Morro, California  
 Fremont Winston Walton, Salem, Marion  
 Frank Wascher, Portland, Multnomah  
 Irvin Watson, Coquille, Coos  
 Richard John Werner, Los Angeles, California  
 Clair Wilkes, Hillsboro, Washington  
 John Bushrod Wilson, Corvallis, Benton



## FORESTRY

Ralph Silsby Blackden, Corvallis, Benton  
 Fred Parks Cronemiller, Lakeview, Lake  
 Arthur Robert Lundeen, Mt. Solo, Washington State  
 John Edgar McCollum, Salinas, California  
 Mark Foss Wright, Tumalo, Crook  
 Lloyd Dexter Yates, Milton, Umatilla

## LOGGING ENGINEERING

Clarence Joseph Budelier, Rock Island, Illinois  
 James Arthur Crawford, Burlington, Iowa  
 Charles Arthur Fertig, Hood River, Hood River  
 Paul Freydis, Sutherlin, Douglas  
 Carl Charles Jacoby, Toledo, Washington State  
 Olaf Robert Jonasen, Corvallis, Benton  
 William James O'Neil, Cloquet, Minnesota  
 Harry Clifford Patton, Macleay, Marion  
 Edward Mierer Paulsen, Portland, Multnomah  
 James Thomas Stephens, Seattle, Washington State  
 William James Wakeman, Portland, Multnomah  
 Lee Roy Woods, Jr., Cottage Grove, Lane

## HOME ECONOMICS

Virge Ingrid Anderson, Aurora, Marion  
 Martha Henrietta Bechen, Hillsboro, Washington  
 Gracia Delle Birch, Corvallis, Benton  
 Etta Philippi Boies, Corvallis, Benton  
 Bertha Mildred Booth, Madras, Jefferson  
 Cecil Myra Brogden, Hillsboro, Washington  
 Hallie Lenore Carter, Eugene, Lane  
 Ola LeMoine Clark, Salem, Marion  
 Edna Conner, Sheridan, Yamhill  
 Ruth Lillyn Corbett, Corvallis, Benton  
 Mary Eleanor Currin, Heppner, Morrow  
 Lydia Doolittle, Corvallis, Benton  
 Grace Elizabeth Fitts, Corvallis, Benton  
 Nettie May Fridley, Klondike, Sherman  
 Anna Maud Funk, Etna Mills, California  
 Carolyn Elizabeth Glaser, Lebanon, Linn  
 Zoe Hazel Golden, La Grande, Union  
 Etta Belle Grimes, Charleston, Illinois  
 Faith Hanthorn, Portland, Multnomah  
 Iva May Howey, Corvallis, Benton  
 Esther Cynthia Humphrey, Portland, Multnomah  
 Lillian Mildred Imrie, Melrose, Douglas  
 Marjorie Janes, Portland, Multnomah  
 Anna Marie Johnson, Albany, Linn  
 Lilian Johnson, Corvallis, Benton  
 Ruth Elizabeth Ketchum, Independence, Polk  
 Grace Kinnison, Charleston, Missouri  
 Maude Eliza Lamson, Cottage Grove, Lane  
 Helen MacDonald, Corvallis, Benton  
 Mildred Marian Manuel, Oakland, California  
 Margaret Rhoda Meek, Oakland, California  
 Helen Bernetta Mercer, Salem, Marion  
 Ethel May Metzler, North Bend, Coos  
 Helen Lavena Miller, Corvallis, Benton  
 Mary Blanche Morris Tennant, Iowa  
 Clara May Murphy, Portland, Multnomah  
 Lola Catherine Norton, Vacaville, California  
 Margaret Patterson, Ashland, Jackson  
 Lydia Powell, Monmouth, Polk  
 Sara Watt Prentiss, Bay City, Tillamook  
 Jessamy Roberts, Portland, Multnomah  
 Gladys Belle Rodgers, Gardena, California  
 Hazel Emma Sprague, Corvallis, Benton  
 Dorathea Emily Steusloff, Salem, Marion  
 Martha Bertha Struck, Lyle, Washington State  
 Genevieve Tillery, Corvallis, Benton  
 Fannie Eldora Virgil, Klamath Falls, Klamath  
 Ina Mae Wattenburger, Echo, Umatilla  
 Cleo Oneeta White, McMinnville, Yamhill  
 Olive Isabelle Wilson, Yoncalla, Douglas  
 Lois Dorothy Wright, Portland, Multnomah  
 Minnie Ethel Wright, La Grande, Union  
 Vida Young, Stayton, Marion

CIVIL ENGINEERING

William Anderson, Portland, Multnomah  
John William Bones, Carlton, Yamhill  
Milton Harris, Portland, Multnomah  
Albert Gordon Skelton, Corvallis, Benton

ELECTRICAL ENGINEERING

Henry Blagg, Hood River, Hood River  
John Amos Hooper, Corvallis, Benton  
LeRoy Lester Houck, Dallas, Polk  
Walter Victor Monger, Parkplace, Clackamas  
Donald Chapman Stoppenbach, Portland, Multnomah  
Albrecht Streiff, Hillsdale, Multnomah  
William Williams, Portland, Multnomah

INDUSTRIAL ARTS

Charles Barnard Gatchell, Wakefield, Pennsylvania  
Charles King, Ashland, Jackson  
Harl Craig McCormick, Corvallis, Benton  
Fred Powers, Oakland, Douglas  
Lewis Claude Sanders, Corvallis, Benton

IRRIGATION ENGINEERING

Benjamin Franklin Rush, Elgin, Union

MECHANICAL ENGINEERING

Wilbur Ball, Portland, Multnomah  
Earle Boone, Toledo, Washington State  
John Carlyle Boone, Corvallis, Benton  
Leland David Creighton, Portland, Multnomah  
Herman Graf, Portland, Multnomah  
Leo Klein Hyams, Portland, Multnomah  
Ralph Mills Kenton, Albany, Linn  
Porter Wilson Martin, Corvallis, Benton  
Dwight Gilbert Platt, Idaho Falls, Idaho  
Harry Baxter Porter, Corvallis, Benton  
Robert Franklin Throne, Ashland, Jackson  
Forrest Thrift Wicks, Albany, Linn

MINING ENGINEERING

Will Boyer, Portland, Multnomah  
Cornelius William Meyers, Portland, Multnomah  
Cyril Lawrence Meyers, Portland, Multnomah  
Edwin Harvey Miller, Salem, Marion  
James Lockhart Turnbull, Mooreville, Malheur

CHEMICAL ENGINEERING

Deloss Everett Bullis, Payette, Idaho  
Herbert William Kruger, Sherwood, Washington  
David Clyde Morris, Edmond, Oklahoma  
Ray Prindle, Payette, Idaho

COMMERCE

Winfried Bernard Arens, New York City, New York  
Pearl Faye Barzee, Corvallis, Benton  
Clarence Wilson Bixby, Paulina, Crook  
Lester Lee Branthoover, Payette, Idaho  
Tressa Churchman, Corvallis, Benton  
Margaret Genevieve Frazier, Salem, Marion  
Mary DeEtta Ingham, Portland, Multnomah  
Eslie Floreine Jewel, Corvallis, Benton  
David Morris John, Corvallis, Benton  
Darrel Delos Johnson, Corvallis, Benton  
Louis Merle Johnson, Sunnyside, Washington State  
Floyd Sanford Metzger, Gresham, Multnomah  
Ruth Alma Norman, Milton, Umatilla  
Clara Olga Post, Blachly, Lane  
Robert Ray Reichart, Corvallis, Benton  
Lorene Richards, Corvallis, Benton  
Philip Roddis Sessions, Portland, Multnomah  
Charn Singh Sodhi, Baluchistan, India  
Merle Tillery, Corvallis, Benton  
Zetta Underwood, Lebanon, Linn  
George Warren Vilas, Medford, Jackson  
Ralph Wilcox, Portland, Multnomah

## BACHELOR OF SCIENCE DEGREES, 1916

(Granted at end of Summer Session)

## AGRICULTURE

Hosmer Cullen Gambee, Phoenix, Arizona  
 Louis Phaon Gambee, Corvallis, Benton  
 Marcus Francis Hathaway, Corvallis, Benton

## HOME ECONOMICS

Norma Gladys Bick, Philomath, Benton  
 Elva Merle Bowen, Silverton, Marion  
 Alice Butler, Mapleton, Iowa  
 Evelyn Conklin, Grants Pass, Josephine  
 Keren Lee Davis, Portland, Multnomah  
 Jessie Harritt, Salem, Marion  
 Jessie Ruth Hill, Eugene, Lane  
 Gertrude Hollingsworth, Newberg, Yamhill  
 Iona Margaret Irving, Albany, Linn  
 Lottie Milam, Macon, Missouri  
 Emily Marie Miller, Corvallis, Benton  
 Emma Winifred Patterson, Corvallis, Benton  
 Leora Philippi, Early, Gilliam  
 Alice Petra Pimm, Philomath, Benton  
 Anna Neave Rutledge, Spokane, Washington State  
 Rose Mae Sheridan, Shedd, Linn  
 Esther Ruby Smith, Amity, Yamhill  
 Mildred Helen Soden, Portland, Multnomah  
 Lillian Thordarson, Corvallis, Benton

## ELECTRICAL ENGINEERING

Alston Conway Archbold, Corvallis, Benton  
 George Randolph Thomas, Forest Grove, Washington

## INDUSTRIAL ARTS

William David Allingham, Corvallis, Benton  
 Paul Francis Amort, Corvallis, Benton  
 Brewer Astor Billie, Astoria, Clatsop  
 Lloyd Herbert Blakely, Corvallis, Benton  
 James Alfred Straughan, Pendleton, Umatilla

## COMMERCE

Enid Glenda Leeper, Corvallis, Benton  
 Charles Jacob Williamson, Corvallis, Benton  
 Milton Edwin Woodcock, Corvallis, Benton

## OTHER DEGREES AND DIPLOMAS

## GRADUATE IN PHARMACY

Mary Jane Dunn, Sumpter, Baker  
 Floyd Benton Flanery, Corvallis, Benton  
 Joseph Orlean Genoud, Camas, Washington State  
 Clyde Dale Horner, Corvallis, Benton  
 Clyde Hubbard, Weiser, Idaho  
 Charles Luther Palmer, Baker, Baker  
 Clarence Edwin Pryer, Jr., Fortuna, California  
 Harold Ray Shake, Payette, Idaho

## DIPLOMA, SCHOOL OF MUSIC

Jessie Ruth Darling, Thorne, North Dakota  
 Ruby Ann Lorence, Monmouth, Polk

## VOCATIONAL CERTIFICATES

For the successful completion of the vocational courses in Agriculture, Commerce, Dairying, Forestry, Home Making, and Mechanic Arts, varying in length from one to three years, students are granted certificates which are delivered to them as the requirements are satisfied.

## AGRICULTURE

Joseph Willard Brown, Shedd, Linn  
 William Chris Daniels, Hoquiam, Washington State  
 Donald Monroe Gray, Philomath, Benton  
 Edward Grell, Albany, Linn  
 John Jeppesen, Bacoona, Washington  
 Masno Namba, Portland, Multnomah  
 Charles Payzant, Chehalis, Washington State

DAIRY HUSBANDRY

Ingwald Ferdinand Dahl, Vancouver, Washington State  
Ernest Larson, Turner, Marion  
Ralph Blanchard Rayburn, Whittier, California

HOME ECONOMICS

Elena Anawalt, Jordan Valley, Malheur  
Frances Roberta Brown, Haines, Baker  
Olive Viola Cramer, Corvallis, Benton  
Lois Winnifred Darling, Thorne, North Dakota  
Dorothy Evans, Roseburg, Douglas  
Elsie Echo Frizzell, Rickreall, Polk  
Bertha Gertrude Hopkins, Tulare, California  
Iva Grace Moore, Corvallis, Benton  
Edith Marie Romig, McCoy, Polk  
Hazel Anna Stebbins, Lordsburg, California  
Laura Elaine Stimpson, Corvallis, Benton  
Lois Emily Straight, Lordsburg, California  
Corrine Marian Whitmore, Jermyn, Pennsylvania

MECHANIC ARTS

DeLin Eames, Cordova, Alaska

COMMERCE

Clifford Heegler Moody, Fairbanks, Alaska

Respectfully submitted,

H. M. TENNANT,

Registrar.



## REPORT OF THE TREASURER.

To the Honorable President and Board of Regents of the Oregon Agricultural College,

Gentlemen: Herewith my report covering all Federal, State, and County Appropriations for Maintenance, Buildings, Equipment, Improvements, Repairs, Library, Experiment, Educational Extension, and other scientific and educational purposes.

Because of the limited time between December 31 and the session of the legislature, it is impracticable to bring all reports up to the close of the calendar year; hence I have shown all Maintenance and Special appropriations up to June 30, 1918, Experiment Stations and Educational Extension up to September 30, 1918, and County Extension appropriations up to December 10, 1918.

Respectfully submitted,

C. L. HAWLEY, ,  
Treasurer.

### DIVISION I—RESIDENT INSTRUCTION.

#### STATE AND FEDERAL FUNDS.

July 1, 1916, to June 30, 1917.

##### RECEIPTS

Balance July 1, 1916, (Millage Tax).....	\$ 35,742.34
Balance July 1, 1916, (Land Grant Interest) ..	2,307.27
Balance July 1, 1916 (College Miscell.) .....	33,628.16
Fees, Entrance, Diploma, etc. ....	19,657.14
Millage Tax (2nd half 1916; 1st half 1917).....	362,651.74
Land Grant Interest Fund .....	12,893.05
Morrill-Nelson Fund (Federal) .....	50,000.00

Total Receipts and Balances .....

\$516,879.70

##### DISBURSEMENTS

Salaries .....	\$265,036.24
Labor .....	7,850.06
Office Supplies .....	3,307.46
Class Supplies .....	450.17
Traveling Expenses .....	4,236.76
Heating .....	20,870.84
Janitorial .....	12,338.44
Light and Power .....	8,326.54
Water .....	1,692.09
Campus .....	5,876.79
Telephone and Telegraph .....	1,357.02
Advertising .....	1,349.39
Publications and Printing .....	15,550.74
Miscellaneous Supplies .....	9,660.56
Freight and Express .....	2,599.68
Feeding Stuffs .....	5,065.70
Library .....	2,705.45
Equipment .....	10,021.53
Livestock .....	1,835.05
Contingent, Rentals, etc. ....	1,698.56
Repairs .....	9,980.67
Improvement .....	10,603.39
Forestry Building (Construction) .....	24,729.36
Hog Barn (Construction) .....	5,045.29

Total Disbursements .....

\$432,187.78

Balance June 30, 1917 .....

\$ 84,691.92

# TREASURER

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## STATE AND FEDERAL FUNDS.

July 1, 1917, to June 30, 1918.

### RECEIPTS

Balance July 1, 1917 (Millage Tax) .....	\$ 49,776.46
Balance July 1, 1917 (Land Grant Int.) .....	1,671.63
Balance July 1, 1917 (College Miscell.) .....	33,243.83
Fees, Entrance, Diploma, etc. ....	10 111.58
Millage Tax (2d half 1917; 1st half 1918).....	361,473.91
Land Grant Interest Fund .....	10,973.39
Morrill-Nelson Fund (Federal) .....	50,000.00

Total Receipts and Balances .....	\$517,280.80
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### DISBURSEMENTS

Salaries .....	\$278,442.63
Labor .....	14,464.72
Office Supplies .....	3,862.02
Class Supplies .....	1,091.55
Traveling Expenses .....	7,249.68
Heating .....	24,355.35
Janitorial .....	14,944.59
Light and Power .....	7,508.27
Water .....	2,098.17
Campus .....	7,707.28
Telephone and Telegraph .....	2,606.79
Advertising .....	3,543.27
Publications and Printing .....	19,017.73
Miscellaneous Supplies .....	7,354.07
Freight and Express .....	1,432.12
Library .....	3,960.34
Equipment .....	18,632.15
Livestock .....	1,303.50
Contingent and Rentals .....	1,526.22
Repairs .....	6,163.53
Improvements .....	33,345.64
Hort. By-Products Bldg. ....	14,332.66
Library Bldg .....	21,219.87
Veterinary Hospital Bldg. ....	9,511.36

Total Disbursements .....	\$505,723.51
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Balance June 30, 1918 .....	\$ 11,557.29
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## DEPARTMENTAL FEES.

July 1, 1916, to June 30, 1917.

### RECEIPTS

Balance July 1, 1916.....	\$14,035.27
Fees for Fiscal Year .....	26,053.97

Total Receipts and Balances .....	\$40,094.24
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### DISBURSEMENTS

Transferred to C. M. ....	\$ 8,170.22
Labor .....	2,585.33
Postage and Stationery .....	417.86
Freight and Express .....	1,061.31
Heat, Light and Power, etc. ....	650.92
Class Supplies .....	12,523.84
Supplies .....	1,094.61
Library .....	40.88
Tools and Machinery .....	1,809.17
Furniture and Fixtures .....	1,170.69
Scientific Apparatus .....	333.89
Traveling Expenses .....	350.66
Contingent Expenses .....	32.10

Total Disbursements .....	\$30,241.48
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Balance June 30, 1917 .....	\$ 9,852.76
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## DEPARTMENTAL FEES.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Balance July 1, 1917 .....	\$ 9,852.76
Fees for Fiscal Year .....	23,504.62

Total Receipts and Balances .....	\$33,357.38
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## DISBURSEMENTS

Labor .....	\$ 2,834.73
Publications .....	56.28
Stationery and Small Printing .....	1,129.10
Postage, Telephone and Telegraph .....	727.22
Heat, Light and Power, etc. ....	714.30
Chemical Supplies .....	14,320.55
Supplies .....	3,365.42
Feed .....	4.50
Library .....	194.91
Tools and Machinery .....	928.97
Furniture and Fixtures .....	1,006.96
Scientific Apparatus .....	202.99
Live Stock .....	2.00
Traveling Expenses .....	95.40
Contingent Expenses .....	5.90

Total Disbursements .....	\$25,589.23
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Balance July 1, 1918 .....	\$ 7,768.15
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## MISCELLANEOUS FUND.

July 1, 1916, to June 30, 1917.

## RECEIPTS

For Fiscal Year .....	\$35,900.44
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## DISBURSEMENTS

Salary .....	\$ 3,982.03
Labor .....	1,419.15
Publications .....	10.37
Postage and Stationery .....	325.96
Freight and Express .....	338.77
Heat, Light, Water, Power .....	28.22
Class and Laboratory Supplies .....	60.19
Seeds, Plants and Sundry Supplies .....	2,172.03
Fertilizer .....	11.00
Feeding Stuffs .....	7,020.85
Tools, Machinery and Appliances .....	205.51
Furniture and Fixtures .....	14.45
Scientific Apparatus .....	115.02
Live Stock .....	823.33
Traveling Expenses .....	39.00
Contingent Expenses .....	252.55
Buildings and Lands .....	721.39

Total Expenditures—Misc. Fund Vo's No. 1-207 .....	\$17,539.82
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Balance July 1, 1917 .....	\$18,360.62
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## MISCELLANEOUS FUND.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Balance July 1, 1917 .....	\$18,360.62
Receipts for Fiscal Year .....	45,923.49

Total Receipts and Balances .....	\$64,284.11
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## DISBURSEMENTS

Salaries .....	\$ 9,378.48
Labor .....	9,590.29
Publications .....	12.50
Stationery and Small Printing .....	783.22
Postage Telephone and Telegraph .....	169.14

Heat, Light and Power .....	5.50	
Chemical Supplies .....	130.82	
Supplies .....	10,584.84	
Fertilizer .....	11.00	
Feed .....	15,427.51	
Library .....	11.25	
Tools and Machinery .....	1,236.63	
Furniture and Fixtures .....	1,676.70	
Scientific Apparatus .....	44.74	
Live Stock .....	1,326.05	
Traveling Expenses .....	223.23	
Rentals and Contingent Expenses .....	2,826.72	
Building and Lands .....	193.70	
Total Disbursements .....		\$53,634.32
Balance July 1, 1918 .....		\$10,649.79

## SPECIAL STATE APPROPRIATION—LIBRARY BUILDING.

## Chapter 314—Laws 1917.

## RECEIPTS

Appropriation .....	\$65,000.00
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## DISBURSEMENTS

On Contract .....	65,000.00
Balance .....	

## DIVISION II—AGRICULTURAL EXPERIMENT STATION.

## HOME STATION.

July 1, 1916, to June 30, 1917.

## RECEIPTS

Federal Appropriation—		
Hatch Fund .....	\$15,000.00	
Adams Fund .....	15,000.00	
Total .....		\$30,000.00

## DISBURSEMENTS

	Hatch	Adams
Salaries .....	\$ 7,507.49	\$12,145.90
Labor .....	2,139.00	982.21
Publications .....	915.97	
Postage and Stationery .....	283.75	9.83
Freight and Express .....	86.34	75.22
Heat, Light, Water and Power .....	21.19	96.77
Chemicals and Laboratory Supplies .....	170.60	733.14
Seeds, Plants and Sundry Supplies .....	321.17	287.86
Fertilizers .....	17.65	
Feeding Stuffs .....	1,435.22	54.93
Library .....	61.00	1.50
Tools, Machinery and Appliances .....	265.52	181.95
Furniture and Fixtures .....	103.62	23.08
Scientific Apparatus and Specimens .....	47.45	362.96
Live Stock .....	183.00	
Traveling Expenses .....	1,365.47	44.65
Contingent Expenses .....	20.00	
Building and Lands .....	55.56	
Total Disbursements .....	\$15,000.00	\$15,000.00
Balance June 30, 1917 .....		

## HOME STATION.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Federal Appropriations—		
Hatch Fund .....	\$15,000.00	
Adams Fund .....	15,000.00	
Total .....		\$30,000.00



## DISBURSEMENTS

	Hatch	Adams
Salaries .....	\$11,182.97	\$10,875.09
Labor .....	840.32	1,078.66
Publications .....	458.89	.....
Postage and Stationery .....	84.31	33.98
Freight and Express .....	40.82	117.36
Heat, Light, Water and Power .....	7.17	67.68
Chemicals and Laboratory Supplies .....	28.70	1,451.36
Seeds, Plants and Sundry Supplies .....	249.74	759.55
Fertilizers .....	3.12	.....
Feeding Stuffs .....	1,150.34	63.35
Library .....	.93	4.63
Tools, Machinery and Appliances .....	182.91	103.74
Furniture and Fixtures .....	13.28	30.00
Scientific Apparatus and Specimens .....	27.15	400.25
Live Stock .....	88.50	.....
Traveling Expenses .....	616.30	14.35
Contingent Expenses .....	24.55	.....
Building and Lands .....	.....	.....
Total Disbursements .....	\$15,000.00	\$15,000.00
Balance June 30, 1918 .....	.....	.....

## HOME STATION

July 1, 1916, to June 30, 1918.

## RECEIPTS

Crop and Fruit Pest—		
Balance July 1, 1916 .....	\$369.74	
Scientific Investigation—		
Balance July 1, 1916 .....	117.89	
Total .....		\$487.63

## DISBURSEMENTS

	Crop and Fruit Pest.	Sci. Inv.
Seeds and Supplies .....	\$ 17.25	.....
Postage, etc. ....		\$14.40
Laboratory Supplies .....		11.39
Total .....	\$ 17.25	\$25.79
Balance June 30, 1918 .....		\$ 43.04
Balance June 30, 1918 .....		\$444.59

## BRANCH STATIONS.

July 1, 1916, to June 30, 1917.

## RECEIPTS

	Eastern Oregon	Umatilla	Moro	Harney	Southern Oregon
Balance July 1, 1916 .....	\$ 4,316.57	\$1,718.00	\$1,628.88	\$2,666.80	\$2,562.02
Appropriation .....	7,500.00	3,000.00	2,500.00	4,000.00	5,000.00
Balance 1916 Appropriation .....	.....	.....	.....	.....	.....
Total .....	\$11,816.57	\$4,718.00	\$4,128.88	\$6,666.80	\$7,562.02

## DISBURSEMENTS

Salaries .....	\$ 3,291.31	\$2,159.96	\$ 380.00	\$1,514.92	\$4,087.43
Labor .....	2,789.33	.....	1,106.49	1,278.54	114.85
Postage and Stationery .....	44.99	1.60	1.50	68.68	65.00
Publications .....	19.87	.....	.....	.....	.....
Freight and Express .....	21.51	1.62	12.70	10.83	66.17
Heat, Light and Power .....	23.20	.....	24.60	72.42	85.92
Chemical Supplies .....	.....	.....	.....	.....	55.40
Sundry Supplies .....	146.31	1.00	81.92	383.01	206.96
Water Tax .....	20.00	.....	11.70	.....	.....
Feed Stuffs .....	150.58	710.63	43.55	267.41	82.25
Library .....	.....	.....	.....	.....	3.53
Tools and Machinery .....	112.73	321.25	103.70	193.63	56.50
Traveling .....	106.05	15.70	85.69	247.81	255.13
Buildings and Repairs .....	527.64	123.85	.....	781.38	35.29
Live Stock .....	35.00	.....	21.05	31.22	.....
Contingent .....	7.00	.....	.....	8.00	10.50
Fertilizer .....	.....	.....	.....	2.50	98.61
Furniture and Fixtures .....	.....	.....	.....	18.14	.....
Scientific Apparatus .....	.....	.....	.....	.....	8.49
Total .....	\$ 7,295.52	\$3,335.01	\$1,872.90	\$4,878.49	\$5,232.03
Balance June 30, 1917 .....	\$ 4,521.05	\$1,382.39	\$2,255.98	\$1,788.31	\$2,329.99

## BRANCH STATIONS.

July 1, 1917, to June 30, 1918.

RECEIPTS	Eastern Oregon	Umatilla	Moro	Harney	Southern Oregon
Balance July 1, 1917.....	\$ 4,521.05	\$1,382.39	\$2,255.98	\$1,788.31	\$2,329.99
Appropriation .....	7,500.00	3,000.00	2,500.00	4,000.00	5,000.00
Total .....	\$12,021.05	\$4,382.39	\$4,755.98	\$5,788.31	\$7,329.99

## DISBURSEMENTS

Salaries .....	\$ 861.67	\$1,122.73	\$ 484.75	\$1,719.29	\$3,713.61
Labor .....	5,462.69	900.30	1,290.16	714.41	9.90
Postage and Stationery.....	78.81	39.30	11.00	.....	56.33
Freight and Exp., Tel.....	191.83	26.54	20.14	36.77	5.29
Heat, Light and Power....	304.48	11.88	29.80	49.66	97.07
Scientific Apparatus .....	.....	.....	.....	.....	94.65
Chemical Supplies .....	.....	.....	.....	.....	.....
Seeds and Supplies .....	824.98	169.92	166.15	104.07	296.87
Feed Stuffs .....	261.86	35.91	.....	.....	204.78
Library .....	.....	3.35	5.00	.....	3.24
Tools and Machinery.....	708.28	81.84	10.60	133.00	33.30
Live Stock .....	35.00	500.00	.....	.....	.....
Travel .....	97.50	195.27	59.85	146.85	262.61
Contingent .....	2.40	4.80	.....	.....	6.00
Buildings and Repairs.....	430.35	.....	451.00	372.54	41.84
Furniture and Fixtures .....	21.20	.....	.....	.....	5.40
Fertilizer .....	.....	13.90	.....	.....	16.80
Publications .....	.....	14.50	245.19	55.61	.....
Totals .....	\$ 9,281.05	\$3,120.24	\$2,773.64	\$3,332.20	\$4,895.32
Balance June 30, 1918....	\$ 2,740.00	\$1,262.15	\$1,982.34	\$2,456.11	\$2,434.67

## BRANCH STATIONS.

July 1, 1916, to June 30, 1917.

	J. J. Astor	Hood River
Balance June 30, 1916 .....	\$ 521.68	\$ 462.08
Appropriation—State .....	3,000.00	3,000.00
Appropriation—County .....	.....	.....
Appropriation—Sales .....	864.46	57.50
Total .....	\$4,386.14	\$5,519.58

## DISBURSEMENTS

Salary .....	\$1,628.88	\$3,500.00
Labor .....	890.98	89.00
Postage .....	1.30	83.27
Freight and Express .....	160.43	7.53
Heat, Light and Power .....	207.90	16.49
Seeds and Sundry Supplies .....	289.90	202.06
Fertilizer .....	22.00	4.10
Library .....	.....	5.31
Feeding Supplies .....	1,183.83	.....
Tools and Machinery .....	58.90	482.12
Travel .....	72.89	615.46
Contingent .....	9.50	31.50
Building and Lands .....	5.25	79.68
Publications .....	.....	453.44
Total .....	\$4,531.76	\$5,569.96
Balance July 1, 1917 .....	\$ 145.62	\$ 50.38

Black face figures denote overdraft or deficit.

## BRANCH STATIONS.

July 1, 1917, to June 30, 1918.

	J. J. Astor	Hood River
Balance July 1, 1917 .....	\$ 145.62	\$ 50.38
Appropriation—State .....	3,000.00	3,000.00
Appropriation—County .....		2,000.00
Appropriation—Sales .....	2,732.94	....
Total .....	\$5,587.32	\$4,949.62

## DISBURSEMENTS

Salary .....	\$ 618.33	\$3,571.25
Labor .....	2,056.69	1.75
Chemical Supplies .....		65.26
Postage .....	17.00	103.52
Freight and Express .....	76.62	29.88
Heat, Light and Power .....	1.70	....
Seeds, etc. ....	225.84	50.17
Fertilizer .....	....	4.90
Feeding .....	1,443.53	....
Tools and Machinery .....	128.70	22.15
Live Stock .....	62.05	....
Scientific Apparatus .....	5.00	6.28
Travel .....	27.75	687.86
Contingent .....	2.45	189.67
Building and Land Improvements .....	188.15	....
Total .....	\$4,853.81	\$4,732.69
Balance July 1, 1918.....	\$ 733.51	\$ 216.93

## BRANCH STATIONS.

## Miscellaneous Receipts.

July 1, 1916, to June 30, 1917.

MISCELLANEOUS	Eastern Oregon	Harney	Moro	Southern Oregon	Umatilla
Balance July 1, 1916.....	\$16,613.61	\$45.55	\$ 580.43	\$ .08	\$ 20.44
Sales, etc. ....	8,176.76	....	1,846.03	6.50	878.50
Total Receipts .....	\$24,790.37	\$45.55	\$2,426.46	\$6.58	\$898.94

## EXPENDITURES

Salaries .....	\$ 623.32	....	\$ 70.63	....	....
Labor .....	1,217.56	....	5.85	....	\$ 11.50
Publications .....	....	....	....	....	....
Postage and Stationery .....	39.88	....	28.66	....	7.60
Freight and Express .....	131.76	....	27.83	....	1.48
Heat, Light and Power .....	43.12	....	84.61	....	....
Water Tax .....	....	....	15.20	....	....
Chemical Supplies .....	....	....	....	....	....
Seeds and Supplies .....	187.30	....	246.73	....	1.70
Feeding Stuffs .....	222.59	....	....	....	....
Library .....	....	....	....	....	....
Tools, Machinery .....	888.22	....	447.95	....	32.25
Furniture and Fixtures .....	....	....	61.00	....	....
Scientific Apparatus .....	....	....	....	....	....
Live Stock .....	8,184.66	....	20.00	....	....
Traveling .....	87.40	44.71	73.60	....	27.55
Contingent Expense .....	1.20	....	.90	....	1.20
Buildings and Repairs .....	130.00	....	146.35	....	....
Total Disbursements .....	\$11,757.01	\$44.71	\$1,229.31	...	\$ 83.28
Balance June 30, 1917.....	\$13,033.36	\$ .84	\$1,197.15	\$6.58	\$815.66

Black face figures denote overdraft or deficit.

## BRANCH STATIONS.

## Miscellaneous Receipts.

July 1, 1917, to June 30, 1918.

## MISCELLANEOUS

## RECEIPTS

	Eastern Oregon	Harney	Moro	Southern Oregon	Uma- tilla
Balance July 1, 1917 .....	\$13,033.36	\$ .84	\$1,197.15	\$ 6.58	\$815.66
Sales, etc. ....	31,785.77	2,744.13	984.00	87.48	122.30
Total Receipts .....	\$44,819.13	\$2,744.97	\$2,181.15	\$94.06	\$937.96

## DISBURSEMENTS

Salaries .....	\$ 610.82				
Labor .....	1,983.54	\$ 498.17	\$ 4.75		\$604.20
Publications .....					
Postage and Stationery .....	57.85	84.44			7.89
Freight and Express .....	170.18	18.69			14.01
Heat, Light and Power .....	157.56	69.14	68.78		
Water Tax .....					
Chemical Supplies .....					2.50
Seeds and Supplies .....	320.91	385.13	65.44		3.20
Feeding Stuffs .....	672.75	39.85			
Library .....					
Tools, Imp. and Machinery .....	609.82	66.07	476.35		18.80
Furniture and Fixtures .....	324.99		34.35		
Scientific Apparatus .....	28.80				
Live Stock .....	8,161.12	10.00			
Traveling .....	60.55	195.65			33.23
Contingent Expense .....	35.45	17.20			3.85
Buildings and Repairs .....	508.64	160.62	13.64		18.50

Total Disbursements ....	\$13,712.98	\$1,545.95	\$ 663.31	....	\$706.18
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Balance June 30, 1918....	\$31,106.15	\$1,199.02	\$1,517.84	\$94.06	\$231.78
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## AGRICULTURAL INVESTIGATIONS.

## Chapter 364—Laws 1917.

May 20, 1917, to June 30, 1917.

## RECEIPTS

1917 Appropriation .....		\$5,000.00
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## DISBURSEMENTS

Salaries .....	\$ 125.00
Labor .....	37.95
Publications .....	70.86

Total .....	\$ 233.81
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Balance June 30, 1917.....	\$4,766.19
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## DISBURSEMENTS

Salary .....	\$3 058.34
Labor .....	186.00
Publications .....	545.53
Postage, Telephone and Telegraph .....	.48
Freight and Express .....	79.03
Supplies .....	77.75
Tools and Machinery .....	8.30
Scientific Apparatus .....	22.36
Travel .....	135.00

Total Disbursements .....	\$3,878.98
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Balance June 30, 1918 .....	\$ 887.21
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## AGRICULTURAL INVESTIGATIONS.

## Chapter 364—Laws 1917.

July 1, 1917, to June 30, 1918.

## RECEIPTS

1918 Appropriation .....	\$5,000.00
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## DISBURSEMENTS

Salary .....	\$578.86
Labor .....	12.22
Publications .....	9.44
Postage .....	2.00
Telephone and Telegraph .....	13.96
Library .....	1.20
Travel .....	62.20

Total Disbursements .....	\$ 679.88
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Balance June 30, 1918 .....	\$4,320.12
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## AGRICULTURAL INVESTIGATIONS—COOPERATIVE.

## Chapter 364—Laws 1917.

May 20, 1917, to June 30, 1918.

## RECEIPTS

1917 Appropriation .....	\$10,000.00
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## DISBURSEMENTS

Salary .....	\$5,100.00
Labor .....	1,829.36
Publications .....	158.94
Postage and Stationery .....	42.73
Freight and Express .....	77.90
Heat, Light, Water and Power .....	12.50
Chemical Supplies .....	37.36
Supplies .....	157.95
Fertilizer .....	23.14
Feed .....	2.85
Library .....	24.33
Tools and Machinery .....	4.00
Travel .....	1,343.95
Contingent .....	.40

Total Disbursements .....	\$ 8 815.41
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Balance June 30, 1917 .....	\$ 1,184.59
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## AGRICULTURAL INVESTIGATIONS—COOPERATIVE.

## Chapter 364—Laws 1917.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Balance July 1, 1917—1917 Appropriation .....	\$ 1,184.59
1918 Appropriation .....	10,000.00

Total Receipts .....	\$11,184.59
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## DISBURSEMENTS

Salary .....	\$422.58
Labor .....	306.88
Publications .....	138.09
Postage and Stationery .....	16.98
Freight and Express .....	37.73
Heat .....	.....
Chemical Supplies .....	201.74
Supplies .....	823.90
Library .....	17.85
Tools and Machinery .....	3.90
Furniture and Fixtures .....	2.90
Traveling .....	162.40

Total Disbursements .....	\$ 2,143.95
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Balance June 30, 1918 .....	\$ 9,040.64
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**FERTILIZER INSPECTION.**  
**July 1, 1916, to June 30, 1917.**

**RECEIPTS**

Balance July 1, 1916 .....	\$105.55
Fees for Fertilizer Inspection Service .....	457.62
Total .....	<u>\$563.17</u>

**DISBURSEMENTS**

Salaries and Labor .....	\$233.10
Supplies .....	59.87
Travel and Expense Account .....	75.00
Printing, etc. ....	4.20
Freight, Express and Drayage .....	17.76
Total Disbursements .....	<u>\$389.93</u>
Balance June 30, 1917 .....	<u>\$173.24</u>

**FERTILIZER INSPECTION.**  
**July 1, 1917, to June 30, 1918.**

**RECEIPTS**

Balance July 1, 1917 .....	\$173.24
Fees for Fertilizer Inspection Service .....	454.22
Total .....	<u>\$627.46</u>

**DISBURSEMENTS**

Salaries and Labor .....	\$229.68
Supplies .....	31.90
Traveling Expenses .....	190.69
Printing .....	14.11
Freight, Express, Telephone and Telegraph.....	20.33
Total Disbursements .....	<u>\$486.71</u>
Balance June 30, 1918 .....	<u>\$140.75</u>

***DIVISION III—EXTENSION SERVICE.***

**STATE GENERAL EDUCATIONAL EXTENSION FUND.**  
**July 1, 1916, to June 30, 1917.**

**RECEIPTS**

State Appropriation, 1916—Balance .....	\$16,589.84
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**DISBURSEMENTS**

Salary .....	\$8,519.75
Labor .....	482.80
Publications .....	1,685.87
Postage, Freight, Express, Telephone and Tel....	248.04
Sundry Supplies .....	183.11
Stationery and Small Printing .....	227.99
Heat, Light and Power, etc.....	10.80
Tools and Machinery .....	39.88
Furniture and Fixtures .....	851.92
Scientific Apparatus .....	3.06
Travel .....	1,767.38
Total .....	<u>\$14,020.60</u>
Balance June 30, 1917 .....	<u>\$ 2,569.24</u>

**July 1, 1917, to June 30, 1918.**

**RECEIPTS**

State Appropriation, 1916—Balance .....	\$ 2,569.24
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**DISBURSEMENTS**

Printing, etc. ....	\$2,028.88
Postage, etc. ....	275.60
Stationery and Small Printing .....	5.91
Supplies .....	3.00
Total .....	<u>\$ 2,313.39</u>
Balance June 30, 1918 .....	<u>\$ 255.85</u>

## STATE GENERAL EDUCATIONAL EXTENSION FUND.

January 1, 1917, to June 30, 1917.

## RECEIPTS

State Appropriation, 1917 .....	\$25,000.00
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## DISBURSEMENTS

Salary .....	\$17,146.56
Labor .....	1,739.69
Printing and Publication .....	1,113.99
Stationery and Small Printing .....	386.44
Postage, Tel. and Tel. Freight and Express.....	1,011.13
Supplies .....	621.95
Library .....	7.50
Tools and Machinery .....	123.30
Furniture and Fixtures .....	\$4.80
Scientific Apparatus .....	12.70
Travel .....	2,467.44
Contingent .....	7.30

Total .....	\$24,722.80
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Balance June 30, 1917 .....	\$ 277.20
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July 1, 1917, to June 30, 1918.

## RECEIPTS

State Appropriation, 1917—Balance .....	\$ 277.20
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## DISBURSEMENTS

Travel .....	\$ 201.50
Tools and Machinery .....	7.61

Total .....	\$ 209.11
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Balance June 30, 1918 .....	\$ 68.09
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## STATE GENERAL EDUCATIONAL EXTENSION FUND.

January 1, 1918, to June 30, 1918.

## RECEIPTS

State Appropriation, 1918 .....	\$25,000.00
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## DISBURSEMENTS

Salary .....	\$5,619.29
Labor .....	171.61
Printing and Publication .....	19.91
Stationery and Small Printing .....	175.50
Postage, Tel. and Tel., Freight and Express.....	810.80
Supplies .....	33.09
Tools and Machinery .....	7.60
Furniture and Fixtures .....	72.50
Travel .....	1,584.40

Total .....	\$ 8,494.70
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Balance June 30, 1918 .....	\$16,505.30
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## FEDERAL SMITH-LEVER FUND.

July 1, 1916, to June 30, 1917.

## RECEIPTS

Federal Appropriation .....	\$18,151.66
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## DISBURSEMENTS

Salaries .....	\$9,819.99
Labor .....	647.60
Printing and Dis. of Publication.....	981.19
Stationery and Small Printing .....	162.76
Postage, Tel. and Tel., Freight and Express.....	226.01
Supplies .....	607.23
Traveling .....	5,706.88

Total Disbursements .....	\$18,151.66
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## FEDERAL SMITH-LEVER FUND.

July 1, 1917, to June 30, 1918.

### RECEIPTS

Federal Appropriation .....	\$21,856.96
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### DISBURSEMENTS

Salaries .....	\$12,631.26
Labor .....	700.13
Printing and Dist. of Publications .....	920.40
Stationery and Small Printing .....	731.34
Postage, Tel. and Tel., Freight and Express.....	1,465.64
Heating, Light, Water and Power .....	3.25
Supplies .....	373.14
Library .....	3.90
Tools, Machinery and Appliances .....	82.47
Furniture and Fixtures .....	385.56
Scientific Apparatus and Specimens .....	10.62
Traveling .....	4,391.80
Contingent .....	157.45

Total Disbursements .....	\$21,856.96
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## EXTENSION MISCELLANEOUS FUND.

July 1, 1916, to June 30, 1917.

### RECEIPTS

Balance July 1, 1916 .....	\$ 260.89
Miscellaneous Sales, etc.....	1,208.38

Total .....	\$1,469.27
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### DISBURSEMENTS

Salaries and Labor .....	\$ 493.56
Supplies .....	37.11
Travel and Expense Account .....	376.41
Miscellaneous—Repairs, Tel. and Tel., etc.....	248.93
Printing, etc. ....	66.65
Freight and Express and Drayage .....	2.00

Total Disbursements .....	\$1,224.66
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Balance June 30, 1917 .....	\$ 244.61
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## EXTENSION MISCELLANEOUS FUND.

July 1, 1917, to June 30, 1918.

### RECEIPTS

Balance July 1, 1917.....	\$ 244.61
Miscellaneous sales, etc. ....	1,840.46

Total .....	\$2,085.07
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### DISBURSEMENTS

Salaries and Labor .....	\$1,389.74
Supplies .....	338.81
Traveling Expense .....	232.39
Contingent Expense .....	140.00
Printing, etc. ....	21.20
Freight and Expense, Tel. and Tel.....	

Total Disbursements .....	\$2,122.14
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Balance June 30, 1918 .....	\$ 37.07
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Black face figures denote overdraft or deficit.



## COOPERATIVE FARM DEMONSTRATION FUND.

July 1, 1916, to June 30, 1917.

## RECEIPTS

Balance July 1, 1916 .....	\$ 4,446.52
State Appropriation 1916-17 .....	15,000.00

Total .....	\$19,446.52
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## DISBURSEMENTS

Salaries .....	\$ 6,372.07
Labor .....	502.66
Postage, Tel. and Tel. and Freight and Express..	376.54
Stationery and Small Printing .....	215.42
Printing and Publications .....	215.35
Seeds and Supplies .....	83.59
Tools and Machinery .....	99.77
Furniture and Fixtures .....	332.84
Heating, Light and Power, etc. ....	4.10
Travel .....	5,617.12
Contingent .....	3.00

Total Disbursements .....	\$13,822.46
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Balance July 30, 1917 .....	\$ 5,624.06
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## COOPERATIVE FARM DEMONSTRATION FUND.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Balance July 1, 1917 .....	\$ 5,624.06
State Appropriation 1917-1918 .....	15,000.00

Total .....	\$20,624.06
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## DISBURSEMENTS

Salaries .....	\$ 5,746.62
Labor .....	532.88
Printing and Publications .....	2,814.48
Stationery and Small Printing .....	593.09
Postage, Tel. and Tel., Freight and Express .....	1,424.57
Supplies .....	223.17
Tools and Machinery .....	86.78
Furniture and Fixtures .....	101.01
Scientific Apparatus .....	39.60
Travel .....	7,448.00
Contingent .....	1.10

Total .....	\$19,011.30
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Balance June 30, 1918.....	\$ 1,612.76
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## BAKER COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

## RECEIPTS

	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriations 17-18 .....	1,600.00	800.00
Total .....	\$1,600.00	\$ 800.00

## DISBURSEMENTS

Salaries .....	\$ 321.00	\$ 224.00
Labor .....	47.25	
Frt. and Exp., Ptg., Stg., Tel. and Tel. ....	72.60	
Stationery and Small Printing .....	84.65	
Supplies .....	9.30	
Tools and Machinery .....	530.40	
Furniture and Fixtures .....	120.85	
Traveling Expenses .....	383.35	
Contingent Expense .....	17.10	3.00
Co. Agt. Rev. Fund .....		250.00

Total .....	\$1,586.50	\$ 477.00
Balance June 30, 1918.....	\$ 13.50	\$ 323.00

## BENTON COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 1,500.00	\$ 1,500.00
Appropriations 17-18 .....	1,500.00	1,500.00
Total .....	\$1,500.00	\$1,500.00

## DISBURSEMENTS

Salaries .....	\$ 73.25	\$ 73.25
Labor .....	39.00	39.00
Publications .....	62.25	62.25
Postage, Frt. and Exp., Tel. and Tel. ....	26.69	26.69
Stationery and Small Printing .....	101.54	101.54
Supplies .....	10.70	10.70
Tools and Machinery .....	467.72	467.72
Furniture and Fixtures .....	193.73	193.73
Scientific Appropriation .....	32.00	32.00
Traveling Expense .....	128.50	128.50
Contingent Expense .....	5.00	5.00
Total .....	\$1,140.38	\$1,140.38
Balance June 30, 1918 .....	\$ 359.62	\$ 359.62

## CLACKAMAS COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 1,500.00	\$ 750.00
Appropriations 17-18 .....	1,500.00	750.00
Total .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salaries .....	\$ 110.46	\$ 236.67
Labor .....	16.80	
Publications .....	58.00	
Freight and Express, Telegraph and Telephone..	12.32	.16
Stationery and Small Printing .....	78.15	20.08
Supplies .....	.95	
Tools and Machinery .....	350.35	
Furniture and Fixtures .....	163.90	
Scientific Apparatus .....	115.04	
Traveling Expense .....	151.40	
Contingent Expense .....		3.00
Co. Agt. Rev. Fund .....		200.00
Total .....	\$1,057.37	\$ 459.91
Balance June 30, 1918 .....	\$ 442.63	\$ 290.09

## CLATSOP COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 1,500.00	\$ 750.00
Appropriations 17-18 .....	1,500.00	750.00
Total .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salaries .....	\$ 358.64	\$ 89.33
Publications .....	18.00	
Freight and Express, Telegraph and Telephone...	20.01	
Stationery and Small Printing .....	41.35	
Library .....	.75	
Tools and Machinery .....	536.80	
Furniture and Fixtures .....	105.00	
Traveling Expense .....	94.54	
Contingent Expense .....		3.00
Co. Agt. Rev. Fund .....		300.00
Total .....	\$1,175.09	\$ 392.33
Balance June 30, 1918 .....	\$ 324.91	\$ 357.67

## COLUMBIA COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ .....	\$ .....
Appropriations 16-17 .....	1,500.00	750.00
Total .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salaries .....	\$ 203.57	\$ 498.00
Labor .....	38.75	
Publications .....	7.70	
Freight and Express, Telegraph and Telephone...	54.68	
Stationery and Small Printing .....	45.00	3.00
Supplies .....	4.85	
Tools and Machinery .....	458.10	5.94
Furniture and Fixtures .....	135.17	1.50
Traveling Expense .....	68.15	
Contingent Expense .....	3.00	
Total .....	\$1,018.97	\$ 508.44
Balance June 30, 1917 .....	\$ 481.03	\$ 241.56

## COLUMBIA COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 481.03	\$ 241.56
Appropriations 17-18 .....	1,500.00	1,500.00
Total .....	\$1,981.03	\$1,741.56

## DISBURSEMENTS

Salaries .....	\$ 542.42	\$ 639.48
Labor .....		88.79
Publications .....	55.10	
Freight and Express, Telegraph and Telephone...	87.66	.52
Stationery and Small Printing .....	92.89	51.70
Supplies .....	.80	2.75
Tools and Machinery .....	132.45	14.92
Furniture and Fixtures .....	88.50	57.50
Traveling Expense .....	630.67	32.01
Contingent Expense .....	7.35	3.00
Co. Agt. Rev. Fund .....		400.00
Total .....	\$1,637.84	\$1,290.67
Balance June 30, 1918 .....	\$ 343.19	\$ 450.89

## COOS COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 685.41	\$ 490.16
Appropriation 16-17 .....	2,000.00	1,250.00
Total .....	\$2,685.41	\$1,740.16

## DISBURSEMENTS

Salary .....	\$ 666.64	\$1,074.97
Labor .....	50.15	172.30
Freight and Express, Telegraph and Telephone...	97.98	
Heat, etc. ....	17.00	
Stationery and Small Printing .....	36.05	7.85
Supplies .....	5.80	
Tools and Machinery .....	415.70	5.99
Furniture and Fixtures .....	70.00	32.40
Traveling .....	283.40	
Contingent .....	126.50	
Total .....	\$1,769.22	\$1,293.51
Balance June 30, 1917.....	\$ 916.19	\$ 446.65

# TREASURER

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## COOS COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 916.19	\$ 446.65
Appropriation 17-18 .....	1,500.00	1,500.00
Total .....	<u>\$2,416.19</u>	<u>\$1,946.65</u>

### DISBURSEMENTS

Salary .....	\$ 584.40	\$ 686.31
Labor .....	225.17	605.63
Publications .....	83.50	
Freight and Express, Telegraph and Telephone .....	147.56	
Water .....	12.00	
Stationery and Small Printing .....	53.90	7.00
Supplies .....	18.25	
Tools and Machinery .....	33.65	7.45
Furniture and Fixtures .....	8.50	
Traveling Expense .....	600.25	
Contingent Expense .....	131.00	3.00
Co. Agt. Rev. Fund .....		300.00
Total .....	<u>\$1,898.18</u>	<u>\$1,609.39</u>
Balance June 30, 1918 .....	\$ 518.01	\$ 337.26

## CROOK AND DESCHUTES COUNTY AGRICULTURISTS.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 903.93	\$ 165.67
Appropriations 16-17 .....	1,600.00	1,750.00
Total .....	<u>\$2,503.93</u>	<u>\$1,915.67</u>

### DISBURSEMENTS

Salaries .....	\$ 500.01	\$1,301.91
Labor .....	187.23	50.75
Freight and Express, Telegraph and Telephone .....	92.05	30.94
Heat and Water .....	5.75	
Stationery and Small Printing .....	74.99	31.88
Supplies .....	11.60	4.45
Tools and Machinery .....	252.50	4.50
Furniture and Fixtures .....	21.00	34.25
Traveling Expense .....	431.52	67.21
Contingent Expense .....	26.00	.45
Total .....	<u>\$1,602.65</u>	<u>\$1,526.34</u>
Balance June 30, 1917 .....	\$ 901.28	\$ 389.33

## CROOK AND DESCHUTES COUNTY AGRICULTURISTS.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 901.28	\$ 389.33
Appropriations 17-18 .....	2,050.00	2,614.00
Total .....	<u>\$2,951.28</u>	<u>\$3,003.33</u>

### DISBURSEMENTS

Salaries .....	\$ 578.43	\$ 829.31
Labor .....	104.35	326.65
Publications .....	15.55	
Freight and Express, Telegraph and Telephone .....	322.17	54.58
Water .....	44.50	
Stationery and Small Printing .....	183.44	45.27
Supplies .....	49.50	6.95
Tools and Machinery .....	244.16	4.30
Furniture and Fixtures .....	47.00	6.97
Traveling Expense .....	792.43	321.25
Contingent Expense .....	27.30	6.00
Co. Agt. Rev. Fund .....		300.00
Total .....	<u>\$2,408.83</u>	<u>\$1,901.28</u>
Balance June 30, 1917 .....	\$ 542.45	\$1,102.05



## OREGON AGRICULTURAL COLLEGE

## DOUGLAS COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriations 17-18 .....	1,600.00	800.00
Total .....	\$1,600.00	\$ 800.00

## DISBURSEMENTS

Salaries .....	\$ 263.00	\$ 328.00
Labor .....	65.00	
Publications .....	24.00	
Freight and Express, Telegraph and Telephone...	39.70	
Stationery and Small Printing .....	97.70	
Supplies .....	4.80	
Library .....	2.00	
Tools and Machinery .....	276.60	
Furniture and Fixtures .....	28.75	
Scientific Apparatus and Specimens .....	15.00	
Traveling Expense .....	366.16	
Contingent Expense .....	52.25	3.00
Co. Agt. Rev. Fund .....		200.00
Total .....	\$1,234.96	\$ 531.00
Balance June 30, 1918 .....	\$ 365.04	\$ 269.00

## GILLIAM COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriations 17-18 .....	1,500.00	750.00
Total .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salaries .....	\$ 41.25	\$ 107.25
Labor .....	18.55	
Publications .....	33.14	
Freight and Express, Telegraph and Telephone...	11.08	3.11
Water .....	15.25	
Stationery and Small Printing .....	31.60	7.68
Supplies .....	3.40	
Tools and Machinery .....	10.35	
Furniture and Fixtures .....	41.25	80.75
Traveling Expense .....	175.80	
Contingent Expense .....	110.00	3.00
Co. Agt. Rev. Fund .....		400.00
Total .....	\$ 491.67	\$ 601.79
Balance June 30, 1918 .....	\$1,008.33	\$ 148.22

## HARNEY COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 2.10	\$ .....
Appropriation 16-17 .....	195.75	139.00
Total .....	\$ 197.85	\$ 139.00

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 197.85	\$ 139.00
Appropriation 17-18 .....		217.00
Total .....	\$ 197.85	\$ 356.00

## DISBURSEMENTS

Labor .....	\$ 195.00	\$ .....
Traveling Expense .....		87.30
Total .....	\$ 195.00	\$ 87.30
Balance June 30, 1918 .....	\$ 2.85	\$ 268.70

## JACKSON COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$1,173.10	\$ 251.27
Appropriations 16-17 .....	2,000.00	2,500.00
Total .....	\$3,173.10	\$2,751.27

## DISBURSEMENTS

Salaries .....	\$1,913.12	\$1,633.32
Labor .....	18.98	10.73
Freight and Express, Telegraph and Telephone...	90.53	5.03
Heat, etc. ....	11.35	3.15
Stationery and Small Printing .....	16.36	15.40
Supplies .....	53.91	28.41
Tools and Machinery .....	240.51	11.00
Scientific Apparatus .....	2.00	
Furniture and Fixtures .....		34.40
Traveling Expense .....	439.02	62.57
Contingent Expense .....	248.30	
Total .....	\$3,034.08	\$1,804.01
Balance June 30, 1917 .....	\$ 139.02	\$ 947.26

## JACKSON COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 139.02	\$ 947.26
Appropriations 17-18 .....	2,000.00	3,000.00*
Total .....	\$2,139.02	\$3,947.26

## DISBURSEMENTS

Salaries .....	\$ 896.97	\$2,265.52
Labor .....	13.90	11.72
Publications .....	61.66	
Freight and Express, Telegraph and Telephone...	128.58	41.21
Water .....	13.45	4.80
Stationery and Small Printing .....	151.85	23.15
Supplies .....	57.44	23.46
Tools and Machinery .....	7.10	13.61
Furniture and Fixtures .....	12.80	1.75
Traveling Expense .....	251.28	334.84
Contingent Expense .....	202.85	63.75
Co. Agt. Rev. Fund .....		400.00
Total .....	\$1,797.88	\$3 183.81
Balance June 30, 1918 .....	\$ 341.14	\$ 763.45

## JOSEPHINE COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 385.64	\$ 507.77
Appropriations 16-17 .....	1,350.00	1,075.00
Total .....	\$1,735.64	\$1,582.77

## DISBURSEMENTS

Salaries .....	\$ 450.50	\$1,210.50
Labor .....	33.30	7.05
Freight and Express, Telegraph and Telephone...	49.36	41.69
Heat and Water .....	2.25	2.00
Stationery and Small Printing .....	21.00	34.05
Supplies .....	13.67	22.96
Tools and Machinery .....		42.29
Furniture and Fixtures .....		4.90
Traveling Expense .....	304.73	149.82
Contingent Expense .....	61.20	40.00
Building Repairs .....		10.00
Total .....	\$ 936.01	\$1,565.26
Balance June 30, 1917 .....	\$ 799.63	\$ 17.51

\*\$500 due.

## OREGON AGRICULTURAL COLLEGE

## JOSEPHINE COUNTY AGRICULTURIST

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 799.63	\$ 17.51
Appropriations 17-18 .....	1,250.00	1,800.00
Total .....	\$2,049.63	\$1,817.51

## DISBURSEMENTS

Salaries .....	\$ 491.00	\$ 769.37
Labor .....	228.50	7.00
Publications .....	41.50	
Freight and Express, Telegraph and Telephone...	60.09	37.41
Water .....	.75	
Stationery and Small Printing .....	136.60	7.25
Supplies .....	12.45	24.44
Tools and Machinery .....	364.35	12.32
Furniture and Fixtures .....	.80	
Traveling Expense .....	289.39	243.07
Contingent Expense .....	49.30	33.10
Co. Agt. Rev. Fund .....		250.00
Total .....	\$1,674.73	\$1,383.96
Balance June 30, 1918.....	\$ 374.90	\$ 433.55

## KLAMATH COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$1,427.23	\$ 585.07
Appropriations 16-17 .....	1,500.00	1,259.55
Total .....	\$2,927.23	\$1,844.62

## DISBURSEMENTS

Salaries .....	\$ 590.01	\$1,634.58
Labor .....	8.50	8.25
Freight and Express, Telegraph and Telephone...	137.42	
Heat and Water .....	5.40	
Stationery and Small Printing .....	10.00	16.40
Supplies .....	43.61	4.40
Tools and Machinery .....	71.25	
Furniture and Fixtures .....	46.00	
Traveling Expense .....	818.14	
Contingent Expense .....	175.25	
Total .....	\$1,905.58	\$1,663.63
Balance June 30, 1917 .....	\$1,021.65	\$ 180.99

## KLAMATH COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$1,021.65	\$ 180.99
Appropriations 17-18 .....	1,500.00	1,500.00
Total .....	\$2,521.65	\$1,680.99

## DISBURSEMENTS

Salary .....	\$ 534.66	\$1,396.35
Labor .....	14.15	
Freight and Express, Telegraph and Telephone...	98.45	
Stationery and Small Printing .....	19.70	23.24
Supplies .....	28.00	
Tools and Machinery .....	1.50	
Furniture and Fixtures .....	22.50	
Traveling Expense .....	1,546.67	9.40
Contingent Expense .....	166.50	3.00
Total .....	\$2,432.13	\$1,431.99
Balance June 30, 1918 .....	\$ 89.52	\$ 249.00

## LAKE COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 538.62	\$ 167.12
Appropriation 16-17 .....		1,450.00
Total .....	\$ 538.62	\$ 1,617.12

## DISBURSEMENTS

Salaries .....	\$ 125.00	\$ 703.80
Freight and Express, Telegraph and Telephone...	1.45	
Stationery and Small Printing .....		8.70
Supplies .....	24.30	30.65
Tools and Machinery .....	43.60	3.75
Traveling Expense .....	341.49	517.40
Total .....	\$ 538.84	\$ 1,264.30
Balance June 30, 1917 .....	\$ 2.78	\$ 352.82

## LAKE COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Total .....	\$ 2.78	\$ 352.82
Appropriations 17-18 .....		
	\$ 2.78	\$ 352.82

## DISBURSEMENTS

Tools and Machinery .....	\$ .....	\$ 288.76
Traveling Expense .....	2.10	
Total .....	\$ 2.10	\$ 288.76
Balance June 30, 1918 .....	\$ .68	\$ 64.06

## LANE COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 735.77	\$ 513.96
Appropriations 16-17 .....	1,500.00	1,500.00
Total .....	\$2,235.77	\$2,013.96

## DISBURSEMENTS

Salaries .....	\$ 768.17	\$1,657.99
Labor .....	3.65	2.75
Freight and Express, Telegraph and Telephone...	121.98	45.46
Heat and Water, etc. ....	17.07	1.00
Stationery and Small Printing .....	86.24	37.60
Supplies .....	19.34	12.75
Tools and Machinery .....	375.55	.60
Furniture and Fixtures .....	10.50	14.50
Traveling Expense .....	674.41	152.11
Contingent Expense .....	157.00	15.00
Total .....	\$2,233.91	\$1,939.76
Balance June 30, 1917.....	\$ 1.86	\$ 74.20

## LANE COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 1.86	\$ 74.20
Appropriations 17-18 .....	2,500.00	2,250.00
Total .....	\$2,501.86	\$2,324.20



## DISBURSEMENTS

Salaries .....	\$ 574.66	\$1,100.39
Labor .....	.80	5.85
Publications .....	42.34	
Freight and Express, Telegraph and Telephone...	60.79	50.65
Heat and Water .....	6.57	
Stationery and Small Printing .....	99.14	62.30
Supplies .....	9.60	14.20
Library .....	.25	
Tools and Machinery .....	18.45	54.68
Furniture and Fixtures .....	40.85	12.75
Traveling .....	371.91	269.86
Contingent Expense .....	197.40	101.50
Co. Agt. Rev. Fund .....		300.00
Total .....	\$1,422.77	\$1,972.18
Balance June 30, 1918 .....	\$1,079.09	\$ 352.02

## LINCOLN COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriation 17-18 .....	1,500.00	\$ 750.00
Total .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salary .....	\$ 117.88	\$ 77.00
Labor .....	18.96	
Publications .....	46.66	
Freight and Express, Telegraph and Telephone...	14.32	1.69
Heat and Water .....	1.75	
Stationery and Small Printing .....	23.35	7.68
Supplies .....	1.00	
Tools and Machinery .....	1.10	
Furniture and Fixtures .....	19.65	69.90
Traveling Expense .....	105.19	
Contingent Expense .....	19.00	3.00
Co. Agt. Rev. Fund .....		350.00
Total .....	\$ 368.86	\$ 509.27
Balance June 30, 1918.....	\$1,131.14	\$ 240.73

## LINN COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriations 17-18 .....	1,300.00	1,300.00
Total .....	\$1,300.00	\$1,300.00

## DISBURSEMENTS

Salaries .....	\$ 3.85	\$ 216.65
Freight and Express, Telegraph and Telephone...	.76	
Stationery and Small Printing .....	21.95	
Library .....	1.00	
Furniture and Fixtures .....	7.40	
Traveling Expense .....	44.21	
Contingent Expense .....	4.50	3.00
Co. Agt. Rev. Fund .....		400.00
Total .....	\$ 83.67	\$ 619.65
Balance .....	\$1,216.33	\$ 680.35

## MALHEUR COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 827.48	\$ 307.46
Appropriation, 16-17 .....	1,500.00	1,500.00
Total .....	\$2,327.48	\$1,807.46

## TREASURER

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## DISBURSEMENTS

Salaries .....	\$ 266.66	\$1,412.55
Labor .....	44.65	3 80
Freight and Express, Telephone and Telegraph....	10.07	
Stationery and Small Printing .....	13.25	7.85
Supplies .....	3.00	
Tools and Machinery .....	29.25	
Furniture and Fixtures .....	22.50	
Traveling Expense .....	591.82	
Contingent Expense .....	4.50	
Total .....	\$ 985.70	\$1,424.20
Balance June 30, 1917 .....	\$1,341.78	\$ 383.26

## MALHEUR COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

## RECEIPTS

	State	County
Balance July 1, 1917 .....	\$ .....	\$ 383.26
Appropriation, 17-18 .....	1,341.78	750.00
Total .....	\$1,341.78	\$1,133.26

## DISBURSEMENTS

Salaries .....	\$ 132.00	\$ 540.99
Labor .....	50.50	133.33
Freight and Express, Telephone and Telegraph....	23.64	
Stationery and Small Printing .....	46.15	6.00
Tools and Machinery .....	111.30	
Traveling Expense .....	682.00	
Contingent Expense .....	.75	
Total .....	\$1,046.34	\$ 680.32
Balance June 30, 1918 .....	\$ 295.44	\$ 452.94

## MARION COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

## RECEIPTS

	State	County
Balance July 1, 1916 .....	\$3.20	
Appropriation, 16-17 .....	.....	
Total .....	\$3.20	

July 1, 1917, to June 30, 1918.

## RECEIPTS

	State	County
Balance July 1, 1917 .....	\$3.20	
Appropriation, 17-18 .....	.....	
Total .....	\$3.20	

## MORROW COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

## RECEIPTS

	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriation, 17-18 .....	1,500.00	750.00
Total .....	\$1,500.00	\$ 750.00

## DISBURSEMENTS

Salaries .....	\$ 276.83	\$ 237.07
Labor .....		127.53
Publications .....	55.19	
Freight and Express, Telephone and Telegraph....	28.14	
Heat and Water .....	6.35	
Stationery and Small Printing .....	21.75	
Supplies .....	6.00	
Tools and Machinery .....	453.83	
Furniture and Fixtures .....	199.40	
Scientific Apparatus .....	.50	
Traveling Expense .....	291.67	
Contingent Expense .....	50.00	3.00
Co. Agt. Rev. Fund .....		250.00
Total .....	\$1,389.96	\$ 617.60
Balance June 30, 1918 .....	\$ 110.04	\$ 132.40

## OREGON AGRICULTURAL COLLEGE

## MULTNOMAH COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS		State	County
Balance July 1, 1916 .....		\$ 504.11	\$ 347.65
Appropriations, 16-17 .....		1,600.00	1,600.00
Total .....		\$2,104.11	\$1,947.65
DISBURSEMENTS			
Salaries .....	\$ 699.62		\$1,350.00
Labor .....	66.00		
Post, Freight and Express .....	151.09		
Heat, etc. ....	.85		
Stationery and Small Printing .....	68.40		16.30
Supplies .....	12.65		
Scientific Apparatus .....			26.50
Tools and Machinery .....	52.25		5.94
Furniture and Fixtures .....	10.53		15.30
Traveling Expense .....	322.57		
Contingent Expense .....	91.45		
Total .....	\$1,475.41		\$1,414.04
Balance June 30, 1917 .....	\$ 628.70		\$ 533.61

## MULTNOMAH COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS		State	County
Balance July 1, 1917 .....	\$ 628.70		\$ 533.61
Appropriations, 17-18 .....	1,800.00		1,700.00
Total .....	\$2,428.70		\$2,233.61
DISBURSEMENTS			
Salaries .....	\$ 418.00		\$1,644.81
Labor .....	26.90		
Publications .....	123.01		
Freight and Exp., Ptg. and Sta., Tel. and Tel. ....	216.77		
Stationery and Small Printing .....	105.45		13.00
Supplies .....	12.38		
Tools and Machinery .....	.25		4.61
Library .....	2.90		
Furniture and Fixtures .....	8.20		
Traveling Expense .....	556.74		
Contingent Expense .....	116.05		3.00
Co. Agt. Rev. Fund .....			400.00
Total .....	\$1,586.65		\$2,065.42
Balance June 30, 1918 .....	\$ 842.05		\$ 168.19

## SHERMAN COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS		State	County
Balance July 1, 1917 .....	\$ .....		\$ .....
Appropriation 17-18 .....	1,500.00		1,000.00
Total .....	\$1,500.00		\$1,000.00
DISBURSEMENTS			
Salaries .....	\$ 224.28		\$ 132.00
Publications .....	33.75		
Freight and Express, Telegraph and Telephone...	25.06		
Heat and Water .....	4.75		
Stationery and Small Printing .....	46.56		
Supplies .....	8.57		
Tools and Machinery .....	532.97		
Furniture and Fixtures .....	88.41		9.50
Traveling Expense .....	92.16		
Contingent Expense .....	26.50		3.00
Co. Agt. Rev. Fund .....			400.00
Total .....	\$1,083.01		\$ 544.50
Balance June 30, 1918 .....	\$ 416.99		\$ 455.50

# TREASURER

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## TILLAMOOK COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$2,579.05	\$ 10.71
Appropriations, 16-17 .....	1,500.00	1,875.00
Total .....	\$4,079.05	\$1,885.71
DISBURSEMENTS		
Salaries .....	\$ 521.67	\$1,684.65
Freight and Express, Telegraph and Telephone...	42.86	
Supplies .....	22.63	
Tools and Machinery .....	382.80	
Stationery and Small Printing .....		29.30
Furniture and Fixtures .....	24.00	
Traveling Expense .....	279.74	
Contingent Expense .....	.60	
Total .....	\$1,274.30	\$1,713.95
Balance June 30, 1917 .....	\$2,804.75	\$ 171.76

## TILLAMOOK COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$2,804.75	\$ 171.76
Appropriations, 17-18 .....	1,500.00	1,500.00
Total .....	\$4,304.75	\$1,671.76
DISBURSEMENTS		
Salaries .....	\$ 910.93	\$1,152.06
Labor .....	12.80	
Publications .....	6.60	
Freight and Express, Telegraph and Telephone...	141.33	.25
Stationery and Small Printing .....	56.25	4.50
Supplies .....	42.95	
Tools and Machinery .....	8.75	6.03
Furniture and Fixtures .....	1.00	
Traveling Expense .....	747.11	
Contingent Expense .....	3.60	3.00
Co. Agt. Rev. Fund .....		400.00
Total .....	\$1,931.32	\$1,565.84
Balance June 30, 1918 .....	\$2,373.43	\$ 105.92

## UMATILLA COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriation, 17-18 .....	1,800.00	900.00
Total .....	\$1,800.00	\$ 900.00
DISBURSEMENTS		
Salaries .....	\$ 139.54	\$ 445.43
Labor .....	122.68	
Publications .....	103.56	
Freight and Express, Telegraph and Telephone...	100.53	
Stationery and Small Printing .....	52.45	
Supplies .....	2.50	
Library .....	12.00	
Tools and Machinery .....	470.53	
Furniture and Fixtures .....	46.80	
Traveling Expense .....	233.01	
Contingent Expense .....	11.50	3.00
Co. Agt. Rev. Fund .....		300.00
Total .....	\$1,295.10	\$ 748.43
Balance June 30, 1918 .....	\$ 504.90	\$ 151.57



## UNION COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$1,279.16	\$ 368.89
Appropriation, 16-17 .....	1,700.00	1,700.00
Total .....	\$2,979.16	\$2,068.89

## DISBURSEMENTS

Salaries .....	\$ 483.31	\$1,037.48
Labor .....	26.50	197.50
Publications .....	42.00	
Freight and Express, Telegraph and Telephone...	119.47	.55
Stationery and Small Printing .....	28.35	10.35
Supplies .....	10.85	.75
Tools and Machinery .....	214.75	
Furniture and Fixtures .....		31.07
Travel .....	385.36	165.60
Contingent Expense .....	3.00	
Total .....	\$1,313.59	\$1,443.30
Balance June 30, 1917 .....	\$1,665.57	\$ 625.59

## UNION COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$1,665.57	\$ 625.59
Appropriations, 17-18 .....	1,400.00	1,550.00
Total .....	\$3,065.57	\$2,175.59

## DISBURSEMENTS

Salaries .....	\$ 512.33	\$ 475.00
Labor .....	66.00	1,446.74
Publications .....	63.76	
Postage, Frt. and Exp., Tel. and Tel. ....	170.92	8.00
Stationery and Small Printing .....	102.00	
Supplies .....	4.75	.30
Tools and Machinery .....	12.00	7.20
Scientific Apparatus .....	35.00	
Traveling Expense .....	839.37	81.65
Contingent Expense .....	3.00	3.00
Total .....	\$1,809.13	\$2,021.89
Balance June 30, 1918 .....	\$1,256.44	\$ 153.70

## WALLOWA COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriation, 17-18 .....	1,600.00	800.00
Total .....	\$1,600.00	\$ 800.00

## DISBURSEMENTS

Salaries .....	\$ 335.60	\$ 358.00
Labor .....	6.20	
Publications .....	45.50	
Freight and Express, Telegraph and Telephone...	36.22	
Stationery and Small Printing .....	36.45	
Supplies .....	.60	
Tools and Machinery .....	437.50	
Furniture and Fixtures .....	96.00	9.50
Traveling Expense .....	188.10	
Contingent Expense .....	.30	
Co. Agt. Rev. Fund .....		250.00

Total .....	\$1,182.47	\$ 617.50
Balance June 30, 1918 .....	\$ 417.53	\$ 182.50

## WASCO COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 823.43	\$ 578.78
Appropriation, 16-17 .....	1,600.00	1,700.00
Total .....	\$2,423.43	\$2,278.78

## DISBURSEMENTS

Salaries .....	\$ 375.49	\$1,682.49
Freight and Express, Telegraph and Telephone...	128.92	
Heat and Water, etc. ....	1.25	
Stationery and Small Printing .....	155.16	17.10
Supplies .....	79.13	
Tools and Machinery .....	256.56	8.75
Furniture and Fixtures .....	136.60	
Travel .....	864.14	65.26
Contingent Expense .....	6.75	
Total .....	\$2,004.00	\$1,773.60
Balance June 30, 1917 .....	\$ 419.43	\$ 505.18

## WASCO COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 419.43	\$ 505.18
Appropriation, 17-18 .....	1,800.00	1,700.00
Total .....	\$2,219.43	\$2,205.18

## DISBURSEMENTS

Salary .....	\$ 445.68	\$ 982.34
Labor .....	6.90	655.32
Publications .....	72.28	
Freight and Express, Telegraph and Telephone...	100.19	78.51
Heat and Water, etc. ....	5.20	
Stationery and Small Printing .....	219.95	48.75
Supplies .....	10.93	6.60
Tools and Machinery .....	6.60	25.23
Furniture and Fixtures .....	16.25	
Scientific Apparatus .....	6.50	
Traveling Expense .....	727.19	348.63
Contingent Expense .....	3.25	3.00
Total .....	\$1,620.92	\$2,148.38
Balance June 30, 1918 .....	\$ 598.51	\$ 56.80

## WASHINGTON COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ .....	\$ .....
Appropriation, 17-18 .....	1,600.00	800.00
Total .....	\$1,600.00	\$ 800.00

## DISBURSEMENTS

Salary .....	\$ 250.05	\$ 310.25
Freight and Express, Telegraph and Telephone...	17.40	
Stationery and Small Printing .....	38.45	
Supplies .....	3.50	
Library .....	5.00	
Tools and Machinery .....	482.66	
Furniture and Fixtures .....	221.30	9.50
Traveling Expense .....	126.42	
Contingent Expense .....	10.00	3.00
Co. Agt. Rev. Fund .....		250.00
Total .....	\$1,154.78	\$ 572.75
Balance June 30, 1918 .....	\$ 445.22	\$ 227.25

## OREGON AGRICULTURAL COLLEGE

## WHEELER COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 468.25	\$ 431.18
Appropriation, 16-17 .....	600.00	976.50
Total .....	\$1,068.25	\$1,407.68

## DISBURSEMENTS

Salary .....	\$ 480.00	\$ 694.53
Labor .....	.....	3.90
Post., Tel. and Tel. and Exp. ....	11.02	2.40
Stationery and Small Printing .....	7.10	11.20
Supplies .....	10.95	4.55
Tools and Machinery .....	23.05	25.86
Traveling Expense .....	483.41	272.10
Contingent .....	12.90	.....
Total .....	\$1,028.43	\$1,014.54
Balance June 30, 1917.....	\$ 39.82	\$ 393.14

## WHEELER COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 39.82	\$ 393.14
Appropriation, 17-18 .....	289.15	847.64
Total .....	\$ 328.97	\$1,240.78

## DISBURSEMENTS

Salary .....	\$ 17.48	\$ 704.00
Freight and Express, Telegraph and Telephone...	33.10	3.62
Stationery and Small Printing .....	.....	4.25
Supplies .....	5.94	.....
Tools and Machinery .....	5.90	.....
Furniture and Fixtures .....	22.50	.....
Traveling Expense .....	236.05	500.55
Contingent Expense .....	8.00	24.00
Total .....	\$ 328.97	\$1,236.42
Balance June 30, 1918.....	.....	\$ 4.36

## YAMHILL COUNTY AGRICULTURIST.

July 1, 1916, to June 30, 1917.

RECEIPTS	State	County
Balance July 1, 1916 .....	\$ 735.18	\$ 288.67
Appropriation, 16-17 .....	850.00	1,600.00
Total .....	\$1,585.18	\$1,888.67

## DISBURSEMENTS

Salary .....	\$ 377.64	\$1,478.81
Labor .....	.....	11.00
Freight and Express, Telegraph and Telephone...	125.66	70.70
Stationery and Small Printing .....	77.80	29.65
Supplies .....	32.80	39.41
Tools and Machinery .....	452.59	36.11
Furniture and Fixtures .....	1.55	2.30
Traveling Expense .....	320.79	192.13
Contingent .....	2.00	2.00
Total .....	\$1,390.83	\$1,862.11
Balance June 30, 1917 .....	\$ 194.35	\$ 26.56

## YAMHILL COUNTY AGRICULTURIST.

July 1, 1917, to June 30, 1918.

RECEIPTS	State	County
Balance July 1, 1917 .....	\$ 194.35	\$ 26.56
Appropriation, 17-18 .....	800.00	800.00
Total .....	\$ 994.35	\$ 826.56

## DISBURSEMENTS

Salary .....	\$ 431.40	\$ 516.00
Publications .....		3.50
Freight and Express, Telegraph and Telephone...	46.89	66.07
Stationery and Small Printing .....	108.80	86.11
Supplies .....	11.87	3.05
Tools and Machinery .....		8.07
Furniture and Fixtures .....	25.50	
Traveling Expense .....	322.99	106.54
Contingent Expense .....	2.00	1.00
Total .....	\$ 955.45	\$ 820.64
Balance June 30, 1918 .....	\$ 38.90	\$ 5.92

*DIVISION IV—MISCELLANEOUS.*

## PURE SEED FUND.

July 1, 1916, to June 30, 1918.

## RECEIPTS

Balance July 1, 1916 .....	\$29.94
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## DISBURSEMENTS

Stationery .....	\$ 6.30
Seeds, Plants, etc. ....	14.43
Labor .....	.66
Repairs .....	8.55
Total .....	\$29.94
Balance June 30, 1918 .....	

## EXTERMINATION OF RABBITS.

July 1, 1916, to June 30, 1918.

## RECEIPTS

Malheur County	
State Fund Balance July 1, 1916 .....	\$68.00
County Fund Balance July 1, 1916 .....	.10
Total .....	\$68.10

## DISBURSEMENTS

Poison .....	\$42.45
Balance June 30, 1918 .....	\$25.65

## STANDARD BABCOCK GLASSWARE TESTING.

July 1, 1916, to June 30, 1917.

## RECEIPTS

Balance July 1, 1916 .....	\$ 9.79
Testing Glassware .....	309.89
Total .....	\$319.68

## DISBURSEMENTS

Salaries and Labor .....	\$211.39
Supplies .....	83.93
Miscellaneous (Equipment Repairs) .....	25.39
Freight and Express and Drayage .....	9.84
Total .....	\$330.55
Overdraft June 30, 1917 .....	\$ 10.87



## STANDARD BABCOCK GLASSWARE TESTING.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Ovedraft July 1, 1917 .....	\$ 10.87
Testing Glassware .....	310.77

Total .....	\$299.90
-------------	----------

## DISBURSEMENTS

Salaries and Labor .....	\$ 83.20
Supplies .....	26.00
Traveling and Expense .....	
Contingent .....	50.00
Freight and Express and Telegraph and Telephone .....	10.24

Total Disbursements .....	\$169.44
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Balance June 30, 1918 .....	\$130.46
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## DORMITORIES.

July 1, 1916, to June 30, 1917.

## RECEIPTS

Balance July 1, 1916 .....	\$ 1,762.81
Table Board-Room Department, etc. ....	44,271.04

Total .....	\$46,033.85
-------------	-------------

## DISBURSEMENTS

Refunds .....	\$ 491.02
Food .....	23,932.81
Supplies .....	1,237.70
Salaries and Labor .....	12,722.43
Heating .....	2,694.00
Light and Power .....	875.38
Water .....	306.73
Freight and Express .....	247.12
Laundry .....	717.16
Telegraph and Telephone .....	65.41
Office Supplies—Stationery and Printing .....	57.87
Improvements and Repairs .....	372.83
Equipment .....	947.73

Total .....	\$44,668.19
-------------	-------------

Balance June 30, 1917 .....	\$ 1,365.66
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## DORMITORIES.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Balance July 1, 1917 .....	\$ 1,365.66
Table Board-Room Department, etc. ....	49,179.80

Total .....	\$50,545.46
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## DISBURSEMENTS

Refunds .....	\$ 777.90
Food .....	23,541.76
Supplies .....	1,541.57
Salaries and Labor .....	12,589.10
Heating .....	
Light and Power .....	478.89
Water .....	342.94
Freight and Express .....	118.08
Laundry .....	579.62
Telegraph and Telephone .....	66.40
Office Supplies .....	76.77
Improvements and Repairs .....	1,178.94
Equipment .....	973.09
Traveling Expense .....	5.15

Total .....	\$42,270.21
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Balance June 30, 1918 .....	\$ 8,275.25
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Black face figures denote overdraft or deficit.

# TREASURER

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## CREAMERY.

July 1, 1916, to June 30, 1917.

### RECEIPTS

Overdraft July 1, 1916 .....	\$ 1,241.63
Sale of Butter, Cream, etc. ....	30,369.11

Total .....	\$29,127.48
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### DISBURSEMENTS

Salaries and Labor .....	\$ 2,133.04
Supplies .....	1,691.77
Butterfat .....	26,000.58
Miscellaneous (Equipment and Repairs) ....	389.17
Printing .....	393.25
Freight and Express and Drayage .....	349.92

Total .....	\$30,957.73
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Overdraft June 30, 1917 .....	\$ 1,830.25*
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\*Creamery products on hand apply on overdraft.

## CREAMERY.

July 1, 1917, to June 30, 1918.

### RECEIPTS

Overdraft July 1, 1917 .....	\$ 1,830.25
Sale of Butter, Cream, etc. ....	35,398.35

Total .....	\$33,568.10
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### DISBURSEMENTS

Salaries and Labor .....	\$ 2,190.28
Supplies .....	1,003.70
Equipment .....	117.00
Drayage .....	292.36
Contingent .....	61.53
Freight and Express, Telegraph and Telephone...	287.17
Butterfat .....	35,520.40

Total .....	\$39,472.44
-------------	-------------

Overdraft June 30, 1918 .....	\$ 5,904.34*
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\*Creamery products on hand 7/1/18 and supplies sold previous to that date for which collection had not been made as of July 1, aggregated \$4,998.84. This applies on the above deficit.

## STUDENT LOAN FUND.

July 1, 1916, to June 30, 1917.

### RECEIPTS

Balance July 1, 1916 .....	\$ 188.46
Donations During Fiscal Year 1916-1917.....	1,223.12
Interest Received .....	200.25
Principal Payments, Contracts .....	3,811.70

Total .....	\$5,423.53
-------------	------------

### DISBURSEMENTS

Loans During Fiscal Year .....	\$4,437.00
--------------------------------	------------

Balance June 30, 1917 .....	\$ 986.53
-----------------------------	-----------

## STUDENT LOAN FUND.

July 1, 1917, to June 30, 1918.

### RECEIPTS

Balance July 1, 1917 .....	\$ 986.53
Donations During Fiscal Year .....	534.75
Interest Received .....	315.25
Principal Payments, Contracts .....	4,841.96

Total .....	\$6,678.49
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### DISBURSEMENTS

Loans During Fiscal Year .....	\$5,263.00
--------------------------------	------------

Balance June 30, 1918 .....	\$1,415.49
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## OREGON AGRICULTURAL COLLEGE

## MILITARY SPECIAL.

July 1, 1916, to June 30, 1917.

## RECEIPTS

Balance July 1, 1916 .....	\$ 271.78
Sale of Uniforms and Accoutrements .....	7,987.18

Total .....	\$8,258.96
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## DISBURSEMENTS

Uniforms and Accoutrements .....	\$7,264.58
Freight and Express .....	106.66
Telephone and Telegraph .....	1.50
Office and General Supplies .....	8.80
Miscellaneous Expense .....	69.42

Total Disbursements .....	\$7,450.96
Balance June 30, 1917 .....	\$ 808.00

## MILITARY SPECIAL.

July 1, 1917, to June 30, 1918.

## RECEIPTS

Balance July 1, 1917 .....	\$ 808.00
Sale of Uniforms and Accoutrements .....	12,398.14

Total .....	\$13,206.14
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## DISBURSEMENTS

Uniforms and Accoutrements .....	\$13,093.60
Freight and Express .....	389.25
Telephone and Telegraph .....	7.32
Office and General Supplies .....	80.00
Labor .....	10.25
Refund on Uniforms .....	222.80
Miscellaneous Expense .....	178.33

Total Disbursements .....	\$13,981.55
Overdraft June 30, 1918 .....	\$ 775.41*

\*Military supplies and uniforms on hand for disposal to students fully cover this deficit.

## ESTIMATES OF REQUIREMENTS

### Resident Instruction Funds.

Estimates of financial requirements for the years 1919 and 1920 for (1) additional assistance, (2) general or miscellaneous maintenance, (3) repairs, (4) improvements, and (5) equipment.

#### I—Additional Assistance.

Following is a list of additional assistance required for each of the years 1919 and 1920 in addition to the present force for resident instruction. (This list is revised to January, 1919.)

	1919	1920	Biennium
Instructor in Dairy Husbandry.....	\$ 1,800	\$ 2,000	\$ 3,800
Instructor Farm Mechanics—Tractor operation and repair .....	1,800	1,800	3,600
Special assistance for short courses in tractor op- eration and repair .....	1,000	1,000	2,000
Instructor in Farm Crops .....	1,400	1,600	3,000
Instructor in Entomology .....	1,400	1,600	3,000
Instructor in Veterinary Medicine (increasing fel- lowship to full-time instructor).....	1,000	1,300	2,300
Instructor in Animal Husbandry (part salary paid by State Stallion Registration Board)..	1,000	1,200	2,200
*Instructor Civil Engineering .....	1,800	1,800	3,600
Instructor Mechanical Engineering.....	1,800	1,800	3,600
*Instructor in Auto Mechanics.....	1,800	1,800	3,600
Instructor Electrical Engineering, salary esti- mated \$1800 per collegiate year (9 months) deduct for present allowance for substitute help \$600 .....	1,200	1,200	2,400
Instructor in Applied Art (increased from part time to full-time) .....	800	1,000	1,800
Instructor in Chemistry .....	1,500	1,500	3,000
Instructor in English .....	1,400	1,500	2,900
Instructor in Mathematics .....	1,600	1,600	3,200
Instructor in Physics .....	1,500	1,500	3,000
Professor Logging Engineering (returning from leave during period of war).....	3,000	3,000	6,000
Instructor Household Arts .....	1,200	1,500	2,700
Instructor Household Science .....	1,200	1,500	2,700
Cataloguer .....	1,500	1,500	3,000
Instructor Accounting and Business Administra- tion .....	1,200	1,400	2,600
Instructor in Office Training.....	1,500	1,500	3,000
	\$32,400	\$34,600	\$67,000

\*These positions already filled through funds provided by State Emergency Board.



## II—General or Miscellaneous Maintenance.

Summary of requirements for general or miscellaneous maintenance. Requirements for class, laboratory, and shop supplies are excluded, as these items are completely covered by student laboratory and shop fees.

	1919	1920	Biennium
Janitorial .....	\$ 19,000	\$ 19,000	\$ 38,000
Heating .....	40,700*	40,700*	81,400
Campus and Greenhouse.....	8,750	8,750	17,500
Light and Power .....	9,200	9,200	18,400
Traveling Expenses .....	6,220	6,220	12,440
Office and General Supplies.....	6,500	6,500	13,000
Publications .....	9,200	9,200	18,400
Advertising .....	4,000	4,000	8,000
Water Tax .....	2,200	2,200	4,400
Summer School .....	2,700	2,700	5,400
Winter Short Course .....	1,000	1,000	2,000
Telephone and Telegraph .....	1,800	1,800	3,600
Nightwatchmen .....	2,500	2,500	5,000
Faculty Committees, Commencement and Convocation expenses, premium on bonds, insurance on Government military equipment, rental Shepard Hall, etc.....	1,955	1,955	3,910
	<u>\$115,725</u>	<u>\$115,725</u>	<u>\$231,450</u>

## III—Repairs.

Below is a summary of the repairs to the buildings listed. The estimates cover the necessary repairs, including interior and exterior painting, refinishing floors, repairing plastering, replacing window shades, refitting doors and windows, repairing down-spouts, roofs, roof gutters, etc.:

	1919	1920	Biennium
Administration Building .....	\$ 320	\$ 370	\$ 690
Agriculture, Horticultural and Agronomy buildings	1,150	2,350	3,500
Armory .....	130	815	945
Dairy Barn .....	175	850	1,025
Dairy Building .....	825	600	1,425
Farm Mechanics Building .....	248	40	288
Foundry and Cabinet Shops.....	300	30	330
Home Economics Building .....	825	375	1,200
Men's Gymnasium .....	450	425	875
Shops .....	675	150	825
Mechanical Hall .....	650	445	1,095
Mines Building .....	350	670	1,020
Old Heating Plant .....	133	50	183
Stock Barn .....	90	50	140
Stock Judging Pavilion .....	50	50	100
Science Hall .....	1,000	988	1,988

\*Budget allowance for heating for the year 1918-19 was \$30,000, on the assumption that coal would be furnished the College at a contract price of \$3.90 per ton. It has been necessary to change the contract, using fuel oil instead of coal. The price of wood has also advanced. In the report to the State Tax Commission on August 13, it was indicated that the probable cost for the year would be \$40,000 to \$43,000. The actual cost as now estimated will be \$39,925. This includes oil at \$2.24 per barrel, and wood at from \$4 to \$4.60 per cord.

Difference between cost present year and 1919 is due to increase in cost of wood, much of the wood for the present year having been bought for 40 cents to 60 cents less per cord than the present rate.

## ESTIMATES OF REQUIREMENTS

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Campus Residence .....	385	25	410
Poultry and Incubator House.....	275	495	770
Women's Gymnasium .....	251	975	1,226
Health Service Building.....	50	50	100
Forestry Building .....	300	500	800
Octagon Barn and Sheds.....	20	15	35
Hog Barn .....	25	35	60
Library Building.....	200	200	400
Veterinary Clinic .....	270	100	370
Products Building .....	100	100	200
	<hr/>	<hr/>	<hr/>
	\$ 9,247	\$10,753	\$20,000

## IV—Improvements.

The following is a summary of the most urgently needed improvements for the biennial period 1919-1920:

1. *Building Improvements—*

Dairy Buildings .....	\$ 175	
Home Economics Building .....	1,020	
Men's Gymnasium .....	165	
Forestry Building.....	75	
Science Hall, including installation additional chemical laboratory on third floor, with necessary plumbing, stationary desks .....	2,485	\$3,920

2. *Fire Protection—*

21 extinguishers and installation of same.....	\$ 310	
Fire alarm and fire escapes, Cauthorn Hall.....	50	
Building hose cart shed.....	50	
New fire hose on fire hose cart.....	260	
Painting fire escapes .....	125	
Changes fire protection apparatus Science Hall.....	40	
Sprinkler for Organic Chemistry Laboratory.....	25	
50 feet hose for old heating plant.....	23	
Replacement of fire line on Twenty-third street.....	120	
Placement of fire escapes on Agricultural Hall.....	400	
Fire alarms .....	277	\$1,680

3. *Campus—*

Cost of labor and material to construct approach walk and drive to north entrance Library Building, including necessary drainage .....	\$ 850
Grading, seeding, planting, on grounds immediately surrounding Library Building.....	875
Additional grading, seeding, and planting in immediate vicinity Farm Mechanics, By-Products, and Barn Buildings .....	200
50 European linden trees on Monroe Street.....	75
Making necessary installations to provide water for irrigation of lawns around the following buildings: Farm Mechanics, By-Products, Dairy Barn, Veterinary Building, Stock Judging, Home Economics, Library, Science Hall .....	305
Cement walk from north Dairy Building to entrance 22nd Street .....	153

Resurfacing roads, graveling, and hauling.....	400	
Gravel, drainage, etc., service wood yard south of heating plant .....	100	
		\$2,958
Arbitrarily reduced by the President of the College to \$1,000 per year or for the biennium.....		\$2,000
Grand total .....		\$7,600
Average per year of biennium.....		\$3,800

### V—Equipment.

Following is a summary by departments of equipment estimated as required for the two years, 1919 and 1920:

#### *Agriculture, School of—*

Animal Husbandry (livestock).....	\$2,000	
Dairy Husbandry .....	2,500	
Farm Crops .....	2,000	
Farm Management .....	500	
Farm Mechanics .....	2,000	
Horticulture .....	500	
Poultry Husbandry .....	500	
Soils, Irrigation and drainage .....	2,000	
Veterinary Medicine .....	1,000	\$13,000

#### *Engineering, School of—*

Civil Engineering .....	1,500	
Electrical Engineering .....	1,500	
Experimental Engineering, including steam, hydraulic and gas engine laboratories .....	4,000	
Industrial Arts, including woodwork, machine, black- smith, and foundry shops.....	3,000	10,000

#### *Mines, School of—*

Including Ceramics, Geology and Mining Departments	2,500
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#### *Commerce, School of—*

Including Department of Business Administration, Office Training, Government and Business Law, and Economics and Sociology .....	500
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#### *Forestry, School of—*

Including Logging Engineering.....	1,000
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#### *Home Economics, School of—*

Including Departments of Household Art, Household Science, Home Administration and Institutional Management .....	2,000
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<i>Pharmacy, School of.....</i>	500
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<i>Vocational Education, School of.....</i>	200
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<i>Chemical Engineering .....</i>	1,500
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*Collaborating Departments—*

Art and Rural Architecture.....	100	
Bacteriology .....	500	
Botany and Plant Pathology .....	500	
Chemistry, including one new laboratory.....	3,000	
English .....	100	
Entomology .....	200	
History .....	50	
Library .....	200	
Mathematics .....	100	
Military .....	500	
Modern Languages .....	100	
Physical Education for Men.....	500	
Physical Education for Women.....	500	
Physics .....	1,000	
Zoology and Physiology .....	3000	\$7,650

*Miscellaneous—*

Office furniture, such as desks, filing cabinets, etc..	500	
2,000 folding chairs for use general gatherings.....	3,000	
Window shades for south and west sides of new Library Building.....	850	4,350
Grand total .....		\$43,200
Average per year of biennium.....		\$21,600

*Arbitrary Reductions—*

Above estimates arbitrarily reduced by the President of the College to \$10,000 per year, or for biennium.....	20,000
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# Oregon Agricultural College Bulletin

Biennial Report of the  
Board of Regents  
1918-1920

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CORVALLIS, OREGON



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The O.A.C. Press

1921



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will automatically be elevated to the presidency next year, is also an alumnus. The secretary of the Oregon State Board of Pharmacy and the executive secretary of the Oregon State Pharmaceutical Association are graduates of the School. Other outstanding graduates are the Director of the health service of the University of Michigan, professors of pharmaceutical subjects in the leading schools of pharmacy who supplemented their training at the College with graduate work at Yale, Wisconsin, Michigan, and other well known institutions. In addition, in the state of Oregon many of the outstanding physicians are graduates of the School of Pharmacy.

**Graduate work.** Each year there is an increasing demand for graduate work. As the School of Pharmacy is not equipped for this work, students are recommended for matriculation in other institutions. With regard to material for original investigation on drug problems, Oregon presents a virgin field. Through the loan of equipment from the drug laboratory of the Oregon State Board of Pharmacy, during the next biennium it is possible that several important research problems on the drugs indigenous to Oregon may be solved.

**Organization and policy.** Because of the inducements offered to our instructors from other institutions and business firms, the School has been unable to hold its faculty. For this reason since 1914 no attempt has been made to change our plan of organization. The constant change of faculty is demoralizing to instructional work. There always will be a change until the College can pay salaries and offer inducements that are comparable with those of other institutions. The School has a definite responsibility to the state which maintains it. When the Dean is obliged to train a new set of instructors almost every year, however, it is impossible to attain the maximum results.

**Resignations.** During the past biennium four instructors resigned from the teaching staff. Dr. F. A. Gilfillan, '18, resigned in 1925 to accept a position as Professor of Pharmacy at the University of Florida; J. L. Powers resigned in 1926 to accept a position with the University of Michigan; Lynn B. Hopkins, '23, and Henry A. Martens, '24, resigned to engage in business.

**Appointments.** For the next fiscal year the following have been appointed:

Harry R. Lewton of the University of Nebraska, Assistant Professor of Pharmacy.

Ralph E. Terry of the University of Southern California, Assistant Professor of Pharmacy.

Lewis C. Britt, '26, Oregon Agricultural College, Instructor in Pharmacy.

Wilma E. Brewer, '25, Oregon Agricultural College, was raised in rank from secretary to Instructor in Pharmacy.

From the training, experience, and accomplishments of these instructors we should have the best balanced faculty since the inception of the School of Pharmacy.

**State Board of Pharmacy.** The regulation of the Oregon State Board of Pharmacy requiring graduation from a Class A curriculum in Pharmacy as a prerequisite for examination became effective July 1, 1925. In addition, before a graduate is allowed to take the examination, his dean must

certify by affidavit that the applicant is of good character, dependable, and accurate.

The State Board of Pharmacy cooperates with the School in all matters relating to courses of instruction. Within the last biennium arrangements have been made whereby all graduates of the School are eligible to take the state Pharmacy examination. Those who pass and have had the required amount of practical drug store experience receive the rating of registered pharmacists. Those who lack practical experience work in drug stores without official status as pharmacists until they have had a total of two years of drug store experience. They are then classed as registered pharmacists.

**Drug Garden.** During the past biennium much interest has been shown in the cultivation of drugs in Oregon, especially in peppermint. Growers expect the School of Pharmacy to furnish them with information concerning the kind of drugs to grow, the species, the best methods of cultivation and curing, and whether the Oregon drugs conform to official standards. As the School is not equipped to do this work, it is unable to carry on experiments to determine the factors that growers need. Many large schools of Pharmacy located in cities where there are no agricultural facilities are conducting drug cultivation with great success. At this institution where land and other facilities are available, together with the mild climate, drug cultivation could be successfully conducted at a low cost. In addition, a drug garden is a favorable adjunct to a School of Pharmacy in furnishing growing drugs for the course in Pharmacognosy and interesting samples for assay. Oregon Agricultural College is the only state-supported institution offering instruction in Pharmacy on the Pacific Coast that is not conducting experiments in drug cultivation. To carry on this important work, I recommend that an allotment of \$400. be appropriated to prepare a drug garden and the necessary equipment, and that \$300 be appropriated annually for maintenance.

**Out of state travel.** To have contact with the organizations that are instrumental in maintaining high standards of the Pharmacy profession, as well as to take an active part in national pharmaceutical affairs, it is incumbent upon representatives of all Class A schools of Pharmacy to attend the annual convention of the American Pharmaceutical Association and the American Conference of Colleges of Pharmacy. Each Conference institution must be represented by a member of the teaching staff once every three years. The Oregon Agricultural College School of Pharmacy was represented in 1924, and it must send a delegate in 1927.

**Recommendations for the next biennium.** (1) That the Manufacturing Pharmacy Laboratory on the ground floor be fully equipped. Estimated cost, \$3,428. (2) As explained under "Needs for Pharmacy Building" certain equipment authorized when the Pharmacy Building was constructed, but not installed. Estimated cost, \$1,489.07. (3) That \$400 be appropriated for the establishment of a drug garden and that an annual appropriation of \$300 be allowed for the maintenance thereof. Estimated cost, \$1,000.

Respectfully submitted,

A. ZIEFLE,  
Dean of the School of Pharmacy.



# REPORT OF THE SCHOOL OF VOCATIONAL EDUCATION

To the President of the College,

Sir: I have the honor to submit the report of the School of Vocational Education for the biennium ending June 30, 1926.

**Organization.** The School of Vocational Education is organized in the main with reference to the needs of three groups of students.

The first group includes students who enroll in courses in education sufficient to meet the professional requirements for teaching in this and other states but who receive their degrees in the technical schools of the College, majoring in such subjects as they expect to teach. For example, prospective teachers of Agriculture in secondary schools receive their degrees from the School of Agriculture but enroll for courses in the School of Vocational Education to the extent of at least 23 credits (15 semester credits) which is the minimum requirement in education for certification of all high school teachers in the state. Similarly prospective teachers of Home Economics, Commerce, and Industrial Arts are registered in their respective technical schools and earn in this school the 23 credits required for certification. The enactment of the Federal Smith-Hughes Act in 1917, a measure in support of vocational education in schools of less than college grade, further emphasized the importance of teacher training for this group.

A second group includes students who prefer a curriculum leading to a degree in the School of Vocational Education. Among these are: (1) graduates of normal schools and transfers from other higher educational institutions interested in continuing their teacher training; (2) those desiring preparation for supervisory and administrative positions; (3) those preparing to teach a combination of vocational branches, or a vocational subject and one or more academic subjects; (4) those preparing to teach, in Smith-Hughes schools or departments, courses in art, mathematics, science, etc., in their relation to the vocational subjects; (5) those desiring special training in physical education as supplementary to any of the foregoing classes. The curriculum for these students includes 36 prescribed and elective credits in education, 62 prescribed credits in general or cultural courses, including the 27 credits specified by the College for all candidates for a bachelor's degree; 3 credits in physical education for men and 11 for women; 12 credits in military science and tactics for men; 83 credits for women and 94 for men in technical and free electives, including courses in the subject-matter of the teaching majors. This distribution is intended to provide a fairly broad foundation for the civic and social demands made on the teacher and also allow time for adequate undergraduate preparation in the teaching specialty and professional training.

The third group is composed of those registered in other schools but pursuing courses in the School of Vocational Education for their general, civic, and cultural values and without reference to preparation for teaching. Students take such courses as electives or upon the recommendation of the schools or departments in which they are majoring. Common among



the courses taken are psychology, civic education, rural education, and general courses in vocational education. The enrollment of students in this group is rapidly increasing.

Beginning with the establishment of a single professorship of industrial pedagogy in 1909, systematic teacher training in the College constantly developed until need for a school organization with departments became apparent. The rapid introduction of different forms of vocational teaching in high schools and other schools below college grade, the passage of the Federal Smith-Hughes Act in 1917 calling for training of special teachers for particular vocational fields, and in 1918 the designation of Oregon Agricultural College as the official institution for giving such training, made it advisable for administrative purposes to perfect a school organization. Such an organization with six departments was effected in 1918 under the title, School of Vocational Education. The departments are as follows: (1) Agricultural Education, (2) Commercial Education, (3) Education, (4) Home Economics Education, (5) Industrial Education, (6) Psychology. A degree curriculum was established in 1921. The table below showing enrollment of students attests the scope of the work.

**Students.** During the biennium student registration in the departments of the School of Vocational Education totaled 4002, including 66 registrations for Supervised Teaching in Physical Education for Women.

Growth of the School is indicated in the following table of enrollment, including those granted degrees.

	Enrollment	Degrees granted
1921-22	101	16
1922-23	156	28
1923-24	253	37
1924-25	330	51
1925-26	387	56

Students in the School of Vocational Education are outstanding in scholarship as evidenced by the number of scholarship awards won each year. The school is represented in all phases of campus activity. Lambda Epsilon, local honor society for women, and Kappa Phi Delta, local honor society for men, encourage high standards by offering membership to worthy students in the school.

**Graduates.** Graduates of the School of Vocational Education find their places in the schools of the country. Placements of Oregon Agricultural College graduates through the appointment service for the year 1924-25 totaled 257, while those of 1925-26 reached 323. These figures include graduates of previous years as well as those of the current year. School officials in the Northwest are looking to the Oregon Agricultural College for teachers experienced and inexperienced, and the appointment secretary cooperates with the students and schools in making recommendations. The 767 names of active teachers on the mailing list in the office of the appointment secretary are distributed as follows: Oregon, 360 (60 in Portland in the grade and high schools); California, 215; Washington, 96; Idaho, 22; Hawaii, 15; Montana, 9; Arizona, 12; Kansas and Nevada, each 6; Wyoming, 5; Canada, China, Illinois, New York and Pennsylvania, each 2; and Alaska, Indiana, Iowa, Massachusetts, Michigan, Nebraska, Ohio, Uruguay, and Utah, 1 each. These figures include 6 superintendents of schools and 34 principals. In view of the fact that many of our graduates are teaching in schools outside the state of Oregon, the following salary schedules may be of interest.

AVERAGE TEACHING SALARIES PAID OREGON AGRICULTURAL COLLEGE  
GRADUATES IN NORTHWEST

	1924-25		1925-26	
	Inexperienced	Experienced	Inexperienced	Experienced
Oregon .....	\$1,501.01	\$1,628.33	\$1,539.66	\$1,838.01
California .....	2,016.16	2,198.83	2,162.33	2,312.16
Washington .....	1,562.00	1,719.80	1,462.66	1,814.20

**Faculty.****Resignations**

Wesleyia Bressler Tucker, secretary to the dean. August, 1925.  
 A. R. Nichols, associate professor of Industrial Education. June, 1926.  
 Jean Vance, critic teacher in Commercial Education. June, 1926.  
 Mrs. C. G. Walkley, critic teacher in Physical Education for Women. June, 1926.  
 Mary Stewart Lyle, critic teacher in Home Economics Education. June, 1926.  
 Mrs. Harriet Moore, critic teacher in Physical Education for Women. June, 1925.

**Appointments**

Hyman Meltzer, B.S. from University of Illinois, M.A. from Teachers College, Columbia, Ph.D. from Teachers College, Columbia, instructor in psychology and education. September, 1925.  
 Mrs. Merle Bonnie Davis, B.S. from Oregon Agricultural College, critic teacher in Home Economics Education. August, 1926.  
 Ruth Slottee, B.S. from Oregon Agricultural College, critic teacher in Commercial Education. June, 1926.  
 Josephine Garvin, critic teacher in Physical Education for Women. June, 1926.  
 Axel Rude, B.A. from University of North Dakota, M.A. from Teachers College, Columbia, instructor in education.

**Promotions**

Florence E. Blazier, from associate professor to professor of Home Economics Education.

**Leaves of Absence**

J. F. Bursch, assistant professor of education, June, 1926, on leave for graduate study at Stanford University.

**Facilities.** The School of Vocational Education has far outgrown its office space. The offices of the dean, secretary, appointment secretary, and of the departments of Agricultural Education, Industrial Education, Education, and Psychology are located in the Forestry Building. The offices and classrooms for the departments of Commercial and Home Economics Education are in the respective technical school buildings of Commerce and Home Economics. Accommodations for the critic teachers are available in the Corvallis High School, where facilities are provided for observation and supervised teaching, through a joint arrangement between the Board of Regents of the College and the Corvallis School Board.

New staff members have been added within the last biennium, but no additional office space has been provided. Four staff members have offices in one room. Two staff members in addition to secretarial help occupy offices in each of two other rooms. One of these rooms is also used for class and laboratory purposes and is provided with desks for the use of graduate students. This situation is somewhat of a handicap in view of the fact that much of the work with students in separate occupational fields must be in the form of personal conferences.

**Service to state.** The School of Vocational Education makes its major contribution to the commonwealth through the work of its graduates who are located in every section of this state and are found also in large numbers in adjoining states. Since public education is a chief function of a state, the graduates of this School render a special and indispensable service. Graduates of this school are not only serving in the capacity of teachers but many become prominent in the capacity of supervisors and administrators in county, city, and state systems of education.

The teachers of certain vocational subjects such as Agriculture are employed on the 12 months basis and conduct much of their teaching

throughout the entire year in the form of projects in the home, on the farm, or in the local community. The importance of helpful and wholesome relations thus formed through such contacts between teachers and pupils and parents alike can hardly be over-emphasized. Records and witnesses clearly verify the fact that many boys have been saved for good citizenship and lives of vocational usefulness largely because of these close personal relations established between teacher and pupil.

Because of the large number and proportion of well trained men who yearly graduate and enter the field of vocational teaching, this school is doing much to answer the charge that the teaching profession is becoming over-feminized. Records in the appointment secretary's office further attest the large place which the graduates of this school are filling not only in their school relations but in the civic, social, and religious life of the community.

Members of the school faculty have given unsparingly of their time in making addresses for institutes, parent-teacher associations, clubs, high school commencements, regional conferences, radio, churches, and other gatherings. Professor James F. Bursch is joint author with Dr. J. C. Almack of Stanford University of a "Textbook on High School Administration" published in 1925. In addition to assisting other departments of the College in the construction and use of objective tests, Professor Bursch and Dr. H. Meltzer are authors of a pamphlet on the modern examination. Two vocational guidance pamphlets written by Professor Bursch have been printed by the College for distribution to high school students. Articles by Professor H. H. Gibson have appeared in the Vocational Education Magazine, a national publication. Professor Gibson has also presented papers dealing with vocational subjects at state and national conventions. He prepared several forms of mimeographed material under such titles as "The Use of Census Reports and Surveys in Teaching Agriculture" and "Guiding Principles in the Organization of Courses in Agriculture." Professor J. F. Brumbaugh has prepared in mimeographed form material for the course given under the title of "Child Mind." Contributions of a similar nature have been made by staff members from other vocational departments of the school.

Reading Circle work is handled by the School of Vocational Education. Books are recommended, questions sent out, manuscripts examined, and certificates issued to the teachers of the state. The Vocational Teachers Exchange is published by the school and mailed to graduates who are teaching and state supervisors and officials of other states.

By means of a follow-up system arranged jointly between the State Board for Vocational Education and the College, representatives from the vocational departments of this school visit graduates during their first year in teaching and by means of observation and personal conferences render a service that is much needed and appreciated by beginning teachers. Considerable correspondence is maintained between members of these departments and the vocational teachers. Special teaching helps are prepared and mailed to teachers upon request or as need arises. By such means graduates in the vocational departments of the school continue to have close personal and professional relations with members of the staff.

**Economies of operation.** Limited office space has already been alluded to. It is hoped that the building program of the College may soon relieve this situation.



All classes in the general courses in psychology and education are large. Practice teaching is now considered an indispensable although somewhat expensive form of teacher-training for all vocational teachers. Economy is secured in this form of teaching by an arrangement between the Board of Regents and the Corvallis School Board whereby each shares equally the expenses for salaries of critic teachers. Facilities in the way of rooms, physical equipment, and travel expense incurred in the supervision of farm, home, and community projects are provided entirely by the local school board. When feasible, prospective teachers are placed in various vocational departments of high schools in this state under the joint supervision of local school administrators and members of our school staff. Thus a most valuable form of teacher training is secured with small expense to the College.

The standard of 15 credit hours per instructor is practically general for all members of the staff. No new courses or instructors are added until needs are clearly defined and demonstrated.

**Graduate Study and Research.** The time has come when this school should give more attention to the demand for graduate work. The appointment secretary reports that her mailing list comprises names of 767 persons now actively engaged in teaching who have either graduated from this institution or have taken work here during summer session. Three hundred and sixty of this number are located in Oregon. Relatively few of our teacher graduates in this state have received their master's degree. None of our vocational teachers in the fields of agriculture and home economics hold the master's degree, and this statement applies in the main to all groups of vocational teachers.

A four-year course of college grade is now required for beginning high school teachers. Certain states hold that four years is not sufficient time in which to acquire both the technical preparation (subject-matter) and professional training and consequently are requiring a five-year teacher-training program. A year of graduate work following a period of teaching is of very great value to our teachers. Their objectives are concrete and definite. The teaching experience which they have gained can be used effectively as a basis for further study. Moreover, education is rapidly becoming a science. Certain important developments are recent. Teachers need to be brought up to date, particularly in the application of scientific method dealing with problems in their special field. Many graduates not only of Oregon Agricultural College but of other institutions are constantly inquiring about our facilities and are requesting that the school make adequate provision for graduate work leading to degrees. We have the staff, and with certain readjustments we are in a position to offer graduate work without great additional expense. Other institutions are now formulating graduate programs for vocational teachers. From the standpoint of the state and this institution it would seem, therefore, that adequate provision should be made within the near future for a graduate program of teacher training.

Since a number of our high school teachers are employed on a 12-months basis, they find it difficult to be absent from their work over long periods of time. Consequently, they desire an arrangement whereby supervision of graduate work under field conditions and relating to their immediate problem can be combined with residence instruction. This arrangement, if made, would require more provision for travel and more adequate facilities for investigation and research on the campus.



The School should make a greater contribution to research in the field of vocational education. To this end and in order to meet the offerings of other institutions, it seems necessary to make some provision for several scholarships and one or two fellowships. We should do our part in the study of general problems; but especially in the study of local problems, since no one else is prepared to attack the problems peculiar to the State of Oregon.

**Needs.** During the past two bienniums the Dean of the School of Vocational Education has recommended the appointment of a field representative who would visit the high schools where Oregon Agricultural College graduates are employed. Inasmuch as many of our teachers are inexperienced and the tenure is very short, great assistance can be rendered the teachers and the schools through such an officer. It has not seemed feasible in the past to appoint such a representative. If this cannot be brought to pass, I should recommend that more travel expenses be provided in order that heads of departments can get into the field sufficiently to assist these vocational teachers.

The appointment of an additional instructor in psychology and education in 1925-26 has enabled the School to round out its undergraduate courses in these fields and to provide a fairly adequate foundation in general training for our vocational teachers. The College should have a bureau of research to assist the various schools and administrative offices in working out technical problems in curricula, teaching methods, student discipline, educational and vocational guidance, and the like. The bureau would require a trained expert at the head who could call upon the staff in the School of Vocational Education and in other schools and departments. The service, involving specialized technique in psychology and education, should be made a part of the School of Vocational Education.

Laboratory instruction should be an important phase of teacher training in the departments concerned with the preparation of teachers in the fields of Agriculture, Commerce, Home Economics, and Industrial Arts. Much of such instruction, including field and home project work, is given in connection with practice teaching. Certain forms, however, involving investigation and research as well as the acquisition of skills should be given under well controlled conditions. A combination library and laboratory room equipped with tables and desks could be made suitable for this purpose. Graduate students particularly should have facilities of this nature.

**Recommendations.** (1) More adequate provision for graduate study leading to advanced degrees. This involves provision for more travel, additional rooms, new courses, and more adequate facilities for research and laboratory work. (2) More convenient headquarters with provisions for additional office rooms. (3) Departmental laboratories. (4) More field work in the form of extension and itinerant teaching by members of our school for the purpose of assisting beginning teachers. (5) A research department as a part of the School of Vocational Education but organized to assist all divisions of the College.

Respectfully submitted,

H. H. GIBSON,  
Acting Dean of the School of Vocational Education.

# REPORT OF THE DEPARTMENT OF CHEMICAL ENGINEERING

To the President of the College,

Sir: I have the honor to submit the following report on the progress of the department of Chemical Engineering for the biennium beginning July 1, 1924, and ending June 30, 1926.

**Organization and policy of the department.** The organization of the department has changed slightly since the last biennial report. The policy of the department is more firmly fixed. A thorough grounding in the fundamental subjects relative to Chemistry is insisted upon in order to give the student a broader point of view, which will enable him to apply these fundamentals in everyday life.

**Curriculum.** The curriculum is now well established and remains practically the same as before. It differs very little from the average curricula as given in other colleges and universities of the United States.

## STUDENTS

	Enrollment	Degrees
1924-25 .....	83	12
1925-26 .....	86	9

**Graduates.** The graduates in Chemical Engineering are doing excellent work, and some have brought honor to the institution. They have been or are now in nearly every large graduate school in the United States. The following is a list of the schools which they have entered: Massachusetts Institute of Technology, Harvard University, Yale University, University of Wisconsin, University of Illinois, Purdue University, Washington University (St. Louis), University of Chicago, University of Minnesota, University of Iowa, Iowa State College, California Institute of Technology, Washington State College and University of Washington. Fegan Tuley, Alfred Robertson, Linus Pauling, and Paul Emmett have received their doctorates from Illinois, Wisconsin, and California Institute of Technology. These men have brought honor to Oregon Agricultural College. Mr. Linus Pauling was given a Guggenheim Fellowship and is now studying in Munich, Germany. Twelve chemical engineers are now doing graduate work in other institutions.

**Facilities for work.** The facilities for work have been increased very materially during the past two years, and we now have excellently equipped laboratories on the fourth floor of Science Hall. Owing to the location, it is necessary to avoid heavy apparatus. Light equipment is being gradually accumulated with the funds allotted.

**Service to the commonwealth.** Research is progressing well, and the students are enthusiastic about the opportunities in the state. Work on cedar oil in the past two years has led to the establishment of a plant at Marshfield. Results now at hand indicate that the Northwest will be a big producer of turpentine and may possibly furnish the turpentine for

the United States within the next few years. This oil is obtained entirely from the waste in the cedar mills. Tests of peppermint oil from Oregon grown peppermint give promise that Oregon may become one of the largest producers of peppermint oil in the United States. A considerable work has been done on this problem. Many liquid air lectures and demonstrations have been given to the various high schools of the state, whereby interest in chemical education has been greatly stimulated. These lectures should be continued.

**Needs.** A full-time instructor will be needed next year to handle the students in Chemical Engineering. Two sections of the junior class will have to be organized, and two years hence two sections for juniors and seniors will have to be organized for laboratory work. Additional laboratory space will have to be arranged.

When Chemical Engineering was assigned to its present quarters, it was thought that we would not need additional space for eight years but the unexpected increase in the enrollment this year forces us to predict that new quarters will have to be provided four years hence. In 1925-26 Chemical Engineering enrolled 86 students, and the first quarter of 1926-27, 118. Next year there will probably be about 160 students in Chemical Engineering.

**Recommendations.** A full-time instructor should be provided for next year. A fireproof addition to Science Hall should be built, and in this new building the department of Chemical Engineering should be allotted sufficient space on the ground floor properly to care for the installation of the heavier apparatus essential to its work. Laboratory accommodations for 150 juniors and 100 seniors should also be provided.

I recommend that the first two floors of the north wing, as proposed for Science Hall, be allotted to the department of Chemical Engineering, and that this building be finished not later than the fall of 1929.

Research is now under way for the investigation of the Chemical resources of the state. We need the services of a geologist for field work during the summer. The nitrate beds in the Owyhee region in Oregon offer an enormous field for research. The alkali lakes abound in chemicals that will put Oregon among the largest producers of sodium carbonate and borax in the world. Some effort should be made to have the titles to these lakes transferred to the College and the University. The revenue which will be derived from these deposits in time, should go to the maintenance of these state institutions. Successfully to carry on this work, \$2,000 should be appropriated each year for summer work.

Respectfully submitted,

FLOYD E. ROWLAND,  
Professor of Chemical Engineering.



# REPORT OF THE DEPARTMENT OF MILITARY SCIENCE AND TACTICS

To the President of the College,

Sir: I have the honor to submit herewith a report of the Military department for the biennium ending June 30, 1926.

**Organization and policy.** In support of the National Defense Act, the Government has maintained at this College for several years a Reserve Officers' Training Corps, composed of the four chief branches of the service: Infantry, Cavalry, Field Artillery, and Engineers. Commissioned officers and enlisted men of the regular army are detailed as instructors to qualify students by proper training to become commissioned officers in the Officers' Reserve Corps.

**Students.** All male students who are physically fit are required to take two years of training in this department, and those juniors and seniors who so elect may take two additional years of training, thereby fitting themselves to become commissioned in the Officers' Reserve Corps. The present enrollment is as follows:

Basic course .....	1,053
Advanced course .....	207
Total .....	1,260

**Service to the commonwealth.** It is almost needless to mention that the greatest quality in the young men who take military training is leadership, the quality which is essential to success in any walk of life.

**Needs and recommendations.** (1) *Drill grounds.* Instruction in the Cavalry and Field Artillery units is retarded through lack of a suitable drill ground. Any ground selected for this purpose must be practicable for mounted work during the rainy season and be close enough to the stables to prevent serious loss of time in going to and returning from drill.

A thorough examination of all bottom-land west of the stables as far out as Oak Creek leads to the belief that none of this land would be suitable for drill purposes during wet weather unless it were provided with a rather elaborate drainage system and deeply surfaced with rock and gravel. Past experience in surfacing the corral at the Military Stables indicates that the cost of draining and surfacing any of this bottom-land over an area large enough for drill purposes would probably be prohibitive.

South of the College there is a tract of land, a portion of which, it is believed, would be practicable for mounted drill throughout the year including the larger part of the rainy season. This tract is now a pasture bounded on the north by the Corvallis-Newport Road, on the south by Mary's River, on the east by a line extended south from 15th street, and on the west by the road extending south from 26th street. A strip of this land about 500 yards long and 200 yards wide, comprising about 24 acres, and lying at the southern edge of this pasture, paralleling the east bank of Mary's River, would, it is believed, be very useful to the Military department. The estimated cost is \$6,000.



To meet the immediate requirements of this department for a mounted drill ground the following is recommended: The department of Animal Husbandry now controls a tract of land lying north of the Oak Creek Road and west of Amity Road. The southeast portion of this land is cultivated. Northwest of the cultivated portion there is a fairly well cleared, but partly wooded ridge extending approximately north and south, the crest of which is easily reached by a lane leading north from the Oak Creek Road. This ridge, the slopes on either side, and the high ground extending from it north and west is now used as pasture land by the department of Animal Husbandry. Along the crest of the southern end of this ridge is a strip of land about 300 yards long and about 150 yards wide (the north boundary being an east and west line wire fence) which would make a very good drill ground for the Cavalry and Field Artillery units at all seasons and one which they could use, it is believed, without detriment to the department of Animal Husbandry. The area desired is small as compared with the great size of the pasture and could easily be indicated by a series of flags or streamers providing limits beyond which units at drill would not go. If, through the cooperation of the department of Animal Husbandry, the Military department is authorized to use the area indicated, the problem of providing a suitable drill ground for our mounted units will in a large measure be solved.

*Repair of Armory.* The fine Armory provided at this College is in a poor state of repair. Serious deterioration in the building can only be arrested by early measures and a suitable appropriation of funds. The repairs urgently needed are as follows: (1) The roof has numerous leaks particularly at the south end. There are also leaks in the roof over the offices. Flagpoles on the north end of the building need repairing. Estimated cost, \$8,000. (2) All doors to the drill floor are in very poor condition and require extensive repairs. Estimated cost, \$150. (3) All offices and hallways need repairs to plaster and tinting. Many windows need repairs. Walls of drill floor need repairs to plaster and painting. Interior finish needs revarnishing in some places. Estimated cost, \$700. (4) The present arms room is of poor appearance and in addition is insecure as a place for storing arms. The present partitions should be replaced by a permanent installation and racks provided for equipment other than rifles. Estimated cost, \$1,500. Total for needed repairs, \$3,150.

Respectfully submitted,

G. W. MOSES,  
Colonel, U. S. A., Commandant.

# REPORT OF THE DEPARTMENT OF PHYSICAL EDUCATION FOR MEN

To the President of the College,

Sir: I have the honor to submit the following report of the department of Physical Education for Men for the biennium beginning July 1, 1924, and ending June 30, 1926, with departmental observations for the future.

**Organization and policy.** There has been very little change in the organization and policy of the department during the past biennium. The policy of having full-time men as instructors with dual responsibilities for physical education and coaching is the general practice. The only exceptions are in some intercollegiate activities, and there only because of lack of funds to provide for some positions on a full-time basis. The department feels a special concern for the health and general physical well-being of the students, which necessitates cooperation and constant coordination with the work of the Health Service. A study has been made, the result of which gives us some concern, regarding the number of students who are unable to get their physical education requirements finished during their freshman and sophomore years. This is caused in most cases by heavy schedules.

**Graduates.** The department is being increasingly called upon for men to fill positions involving teaching, coaching, and general physical education work. Many of our men are making excellent records in this profession, more than two hundred and fifty being in service in Oregon and elsewhere. Where the position does not call for full-time coaching or directing of physical education, our students seem to be especially successful, although full-time as well as combination positions are being successfully held by O. A. C. men.

**Activities.** We have gradually added to our list of activities by way of expansion and by virtue of the fact that we have increased the equipment. Increases are noticed in particular in intramural athletics with the addition of wrestling and swimming on an interclass basis. Forty-five or more organizations represent practically all intramural branches. The popularity of intramural work is steadily increasing. It is conducted with the most painstaking attention. Cooperation is readily secured for prizes. The keen and friendly spirit of competition which prevails with all its benefits, is causing this work to be a real factor in promoting the enjoyment, interest, and health of hundreds of students. All intercollegiate squads have doubled in size.

In intercollegiate competition we reached during the biennium four high points worthy of mention. In football our team defeated all the Northwest Conference teams that it had opportunity to meet in the fall of 1925, and although Washington was not played we were considered the Northwest champions in this sport, having defeated more teams and played more games than Washington in the northern section. In 1925 after tying Oregon in basketball we went into a historic three-game series which we won from Oregon in perhaps the most exacting and

spectacular basketball competition ever experienced between the two institutions. The 1925 baseball team played a stellar brand of ball, were a polished team, and won the Northwest championship with ease. The wrestling team, as usual, carried off the Coast championship in this sport. During all this intensive competition a high type of sportsmanship predominated and large crowds of people showed an intense interest in the contests.

**Corrective work.** A further study has been made and a plan adopted for corrective work or restricted gymnastics. Mr. Grant Swan, one of the new members of our staff, is specializing in this work and is peculiarly fitted for it. We shall eventually work into a full program of corrective work, with some original elements, new equipment, and all essentials that have proved good in established procedure in other institutions.

**Physical examinations, health, and hygiene.** A new plan has been adopted to facilitate a careful medical examination, at the beginning of each year, of all those who take work in the department. We are now securing the services of four practicing physicians during freshman week so that more attention can be given to this important matter. The hygiene class, which is offered especially to those who expect to teach and coach in a physical education capacity, has been attended each term by from fifteen to thirty-five students. Throughout the department personal counsel is regularly given on health matters. The training quarters and facilities are fully equipped, and are rendering service not only to those who are injured, but to students who are concerned about general matters of health, proper amount of work, diet, and such individual problems. This department not only ministers to specialized athletes, but Mr. M. H. "Dad" Butler, trainer, is constantly called upon by other members of the general student body for advice and assistance in keeping physically fit. It is estimated that a minimum of three hundred students a year, by personal interview with some member of the staff, receive the vital facts in answer to their questions concerning health problems and training methods for physical efficiency.

**Recent and future development.** There are a number of anticipated, as well as completed, changes within the building. The locker system has been completely changed and reorganized. Additional classrooms, offices, team rooms, store rooms, etc., either have been arranged or are contemplated. Management within the building, which is in itself an increasing problem, has been improved. Everything possible has been done more nearly to suit the building to the demands that are made upon it. While the procedure is not perfect, the essential building administration processes are working smoothly and thus many and varied interests which use our building are correlated to the best advantage with our own departmental work.

**Outdoor recreation area.** An important new project is the development of the recreational area west of the football field. A comprehensive plan has been worked out with the cooperation of the Landscape Gardening department and a study is being made by individuals and classes in both departments as to the best plan in arranging this area to accommodate the largest number of activities. We are using a ten-



year development plan in this area, which will not be exceedingly expensive but will conform to the best-known methods and procedure in the use of such areas in educational institutions. The rapidly increasing recognition of recreation and health values among students involves a considerable change in policy of interclass competition of all kinds as well as in technical procedure in physical education. We are definitely taking steps to keep abreast of all that is progressive in modern physical education. We recognize the fact that in comparison and study lie the possibility of improvement. There is a clear policy in the department to know the best things that are being done in America affecting student health and a wholesome participation in physical activities, and to exercise a controlling direction toward these established ends.

**Physical Education honorary fraternity.** Sigma Alpha was organized in 1925, with some twenty members, for the purpose of promoting physical education during student days on the campus, and of developing a definite plan to keep in helpful touch with those graduates who will occupy coaching and physical education positions. The organization has done some very effective work and bids fair to be a factor in turning out and following up men who go into teaching positions, sponsoring high ideals of character and efficiency in their chosen profession.

**Progress in theory classes.** The quality of credit courses given in the department has been very materially improved. We think of our theory work as supporting and making complete the qualification of our classes for the teaching profession. An average of from sixty to eighty-five men per year are taking physical education to support their major college course and in many cases to enable them to be more constructively useful and to take a more responsible position. There is a growing demand from the College for this combination rather than for exclusive preparation for coaching or physical education.

**Physical Education interests of the staff and Pacific Coast.** The staff of the department has been well represented at the Western Conference of the American Playground and Recreation Association, the State Teachers Association, and the National Collegiate Athletic Association. We have taken our place whenever possible and shared responsibility in such organizations. We respond as a group to various organizations when we can be of service along recreative and health lines throughout the state.

**Faculty.** Messrs. Swan and Gill, both graduates of the College, were added to the staff. They were chosen because they are highly qualified for the work which they are doing. The department suffered a distinct loss when R. S. Keene and C. W. Hubbard, also graduates of this institution, were called to direct the work at Willamette University and the College of Puget Sound, respectively. These men rendered a faithful and resourceful service to the College during their stay here, and their selection to direct the physical education work at these two institutions of higher learning is a compliment both to them and to the department.

**Staff requirements.** There is need for us eventually to work into our department a new element of more intensified and more complete use of each type of gymnasium apparatus, broadening the service to the stu-



dents. This would require the use of a specialist who has been trained in an exclusively physical training institution for this type of work. Judging from a somewhat hasty survey there is also prospect for rowing as an activity, with very little expense and very wholesome interest, involving a considerable number of students. Rowing, however, is at present entirely experimental.

Respectfully submitted,

W. A. KEARNS,

Director of Physical Education for Men.

# REPORT OF THE DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

To the President of the College,

Sir: I have the honor to submit the following report of the department of Physical Education for Women for the biennium beginning July 1, 1924, and ending June 30, 1926.

**Facilities.** The new Women's Building provides adequate space for physical education activities for the present, and with minor changes in the use of rooms should meet the needs for many years. The pool, showers, and dressing rooms show scientific planning and construction. The gymnasium, the games room, and the corrective room are equally commendable. The College has practically no space, however, developed for outdoor games for women. The field south of the tennis courts and north of Jefferson street, which has been used this fall and during the last few years, is both inadequate and unsuitable. Space west of the new building which has been reserved for play areas should be developed immediately, in order to permit and to encourage growth in interest and skill in out-of-door games. Study of the best surfaces for recreation fields for this section of the country should guide the work and the best drainage should be secured. Out-of-door work is hampered more on this campus by mud than by moisture in the air.

**Need for medical supervision of health work.** "Health work" is used here to designate that part of the work in physical education which seeks to aid each student to develop maximum efficiency in physical vigor. It does not include that work which is primarily curative medicine. Any plan for the development of health and vigor must begin with a careful survey and estimation of the physical and organic condition of each individual. The College has recognized this in its plan to give a medical and physical examination to each entering student. The present plan provides for the examination of entering freshmen during freshman week.

The time allowed for this examination is inadequate. In the time which each student is allowed for inspection, no estimation of the condition of the individual can be made. Only glaring defects of heart and lungs can be detected; in the majority of the cases, students are already aware of these conditions. We need a careful analysis which will bring to light the individuals who are slightly below normal, with weaknesses of which they are not aware. Other details, now omitted, should be included in the examination: eyes, ears, throat, nose, teeth, etc.

At the present time, moreover, medical and physical examinations are given to our students only as they enter. No department can check the results of its work until examinations are given also at the end of each year, or once each year to all students. Medical examinations are most valuable if the examiner can follow up the case. The welfare of the women students would be greatly furthered by a woman physician in residence. A woman physician of the right personality could be in close contact with the women students. She should work in cooperation

with the department of Physical Education for Women, perhaps as head of the corrective department or as a member of the Health Service, spending a portion of each day in the Women's Building.

**Faculty.** Aside from the salaries of the director and the head of the corrective work, the salaries paid are not high enough to retain on the staff women of ability and experience. As we find women capable of doing the highest type of work, we shall have to increase our budget in order to keep them after they have served the necessary two or three years of apprenticeship.

**Courses.** Records on file of the work in the corrective department indicate that work compares favorably with that in other institutions of higher learning. There have been definite goals; records of achievement have been kept. The type of work especially in cooperation with the foods department shows contact with recent developments. There is need for the development of similarly clear objectives in many of the courses. The same need exists in respect to the students themselves. There is a tendency for students to follow the lines of their interest rather than a well-balanced program looking alike to the development of the skills needed in adult life and to adequate preparation for service in the field of health and physical education. The latter consideration is especially important in the case of young women preparing to teach. Students who expect to combine a minor in physical education with their major course should be guided in the selection of activities through the four years.

**Recommendations.** The present report is based upon merely brief acquaintance with the department, its facilities and program. Little beyond observation of conditions can be done the first year. Certain outstanding needs of the department should, however, be pointed out. These are:

- (1) Adequate out-of-door play space in a condition which permits good work.
- (2) More careful health supervision with a woman physician on the campus.

With these essentials added it seems conservative to state that the work of the department can be promptly developed to a degree of efficiency thoroughly in line with the best standards of the present day.

Respectfully submitted,

RUTH B. GLASSOW,  
Director of Physical Education for Women.

# REPORT OF THE SUMMER SESSION

To the President of the College:

Sir: I have the honor to submit the following report for the Summer Session of the Oregon State Agricultural College for the summers of 1924 and 1925, which would be naturally included in the biennium ending June 30, 1926, with some additional reference to the session of 1926.

**Organization.** The Summer Session is a short course of six weeks' duration offering no degree curricula, and appealing to people of varying needs. The staff consists of regular members of the faculty, and of visiting instructors from other institutions who are available for exchange appointments during the summer recess. The students consist to a considerable extent of people employed during the winter months in teaching and other occupations as well as of regular students who wish to use the summer months to shorten the time of their preparation or to include in their course of study subjects for which the requirements of their regular curricula make no provision. The importance of the summer sessions in the present scheme of higher education is evidenced by the fact that in 1925, according to the annual survey of "School and Society," 87,786 students were in attendance in the thirty institutions listed, and that in 1926 there were 742 more.

The history of summer session courses in the United States begins with a realization that the long summer vacation, with its origin principally in the need for the student's labor on the home farm during the summer, had passed for many people with changed conditions and that the summer months might be profitably employed by a continuation of educational opportunities.

The summer school in America finds its first examples in a short-lived school for marine biological study, which Louis Agassiz announced on December 14, 1872, for the next summer, and in the lecture courses at Chautauqua, New York., founded in 1874. Among the early summer schools one of great distinction was the Concord School of Philosophy and Literature opened in Bronson Alcott's study in 1879 and continued until 1887 with the cooperation of Emerson, Thomas Wentworth Higginson, and others of the Concord Group.

Such schools for the study of some special group of subjects, or such popular lecture and reading courses, led the way to the continuance of general academic activity such as is now to be found in many of the larger universities and colleges throughout the country.

With the change in name from Summer School to Summer Session, summer study finally disassociated itself from the spasmodic and the superficial, or the narrowly restricted, and became completely identified with the regular serious college work of the degree-earning curricula.

**Registration.** At Oregon State Agricultural College, the Summer Session since its founding at the opening of the present century has increased steadily in registration and in the quality of the work offered. Figures for the biennium show in 1924 a total registration of 987; of



these 398 were members of the boys' and girls' clubs attending the short course conducted in connection with the Summer Session and 591 were mature students. In 1925 the total registration for the Summer Session was 1,146; of these 453 were juveniles in the boys' and girls' club course and 693 were mature students. Of the latter group, 356, or about one-half of the full-time regular students, were teachers, principals, or superintendents. In 1926 the total registration was 1,068, of whom 483 were juveniles in the boys' and girls' club courses and 585 mature students. This represented a somewhat reduced registration over the preceding year, but larger than that of any other year. As the preceding year had shown an unusual increase of 40 percent, some adjustment was to be looked for. A not dissimilar situation was reflected rather generally throughout the United States. Of the thirty leading institutions for which statistics are given in "School and Society" in 1926, eleven show a loss in comparison with the preceding year, while eighteen gained, and the total for the entire thirty represented a gain of only 792.

**Distinctive service.** During the biennium the Summer Session brought to its staff and made accessible for the students and teachers of Oregon instruction by a number of outstanding men and women, including Dr. Caroline Hedger, of the Elizabeth McCormack Memorial Foundation, Chicago, authority in the field of Child Care; Knute Rockne, director of physical education and coach of athletics at Notre Dame University; Dr. Clara E. Greenough, specialist in health education, now at the head of that work at Skidmore College, New York; and Major John L. Griffith, athletic commissioner of the Big Ten and authority on the organization of athletics and physical education. Many other specialists in various fields distinctive of the institution gave instruction.

Without cost to the state through a friendly relationship which has existed between Coach Schissler and Knute Rockne, the latter's services have been made available at the Summer Session. His services have been paid for exclusively from fees paid by the students taking his work, and without charge against other institutional funds. This coming summer will bring to Corvallis Dr. E. V. McCollum, of Johns Hopkins University, famous for his researches in the field of nutrition, and of interest both to Home Economics students and to the dairy industry; Professor Cora C. Winchell, recognized authority in the field of home economics education, head of the household arts department at Teachers College, Columbia; Miss Florence Jackson, of Wellesley College, an authority in the field of vocational guidance for women; and Knute Rockne.

During the past biennium the Summer Session has pioneered in three distinctive fields: (1) It was the first institution in the Northwest to announce courses for the training of deans or advisers of high school girls. This work is of great advantage to those who plan to teach home economics in the high schools or who combine home economics with work in physical education. Teachers of these subjects come into close contact with their high school students and if equipped with adequate training become exceptionally useful in the guidance they may give in personal conduct, personal hygiene, extra-curricula activities, and vocational selection. This work has been under the direction of Dean Ella E. Wilson, of Franklin High School, Portland. (2) The second field in

which the Summer Session has pioneered has been that of character education methods or moral education. (3) The third field is that of the special coaching work given by Knute Rockne and Major Griffith. As physical education in the state must be directed by those who are also teaching other subjects, it has become highly important that the teachers of the state should have the opportunity of special training along the lines of work which they may be expected to coach. As already explained, this special instruction given by Knute Rockne has been financed entirely out of fees paid by the students taking the work.

**Program.** The Summer Session offers courses in Vocational Education, basic or specialized; Home Economics; Commerce; Industrial Arts; Industrial Journalism; Physical Education for men and for women; and the Basic Arts and Sciences, including Art, Chemistry, English Composition and Literature, History, Public Speaking and Dramatics, and Zoology. A special program for teachers in Music is also given.

The Summer Session emphasizes those departments featured in the degree curricula of the institution. Teachers who have been working hard through the year, however, and students who are specializing in some technical or vocational field, both feel the need of the opportunity to combine with their technical specialties other subjects of more general or cultural character. For this reason provision is made in the Summer Session program for a certain number of courses in literature and art, and history and music. The Summer Session also makes provision for an "out-of-hours" program of readings, concerts, lectures, and social gatherings. These give the student an opportunity to come in contact with stimulating thought-provoking personalities and to know one another.

**Opportunities.** The ideal Pacific Coast climate, which offers in summer the pleasantest period of the year for study, suggests the importance of capitalizing this advantage and of drawing an increasing attendance from less favored sections of the country. That the College is achieving an increasing recognition appears in the registration from other states for the three years 1924, 1925, and 1926, which are 74, 107, and 137 respectively. It is also interesting that the American Educational Digest, educational journal of national circulation, published at Lincoln, Nebraska, headed an editorial comment on the 1925 Summer Session at Oregon State Agricultural College with the words, "A Notable Summer Session."

The presence of out-of-state students in the summer is of definite economic advantage to the state, which invests considerable sums to attract tourists. These summer students are principally teachers. They come for a short period, spend considerable sums of money, and if impressed become, on their departure, the best of advertisements for the state by reason of the influential positions they hold in the communities from which they come. Their coming involves little expense to the institution, as the courses they register for would be needed in any event by native students. Wherever they go afterwards they tell of the wonderful climate and scenery and the educational advantages of Oregon.

The Summer Session brings into use college buildings and equipment otherwise idle during the summer. At present the session lasts but six weeks. Many other institutions make of the summer session a full fourth quarter by continuing for eleven or twelve weeks. The time has arrived or is near at hand when such an extension should be considered at Oregon State Agricultural College. Such an extension would make the plant that much more productive, but the actual increase in cost for salaries for doubling the instruction is at present an obstacle.

Respectfully submitted,

M. ELLWOOD SMITH,  
Director of the Summer Session.

# REPORT OF THE DEAN OF MEN

To the President of the College,

Sir: I have the honor to present herewith a report of the major activities of the office of the Dean of Men for the biennium ending June 30, 1926.

**Functions of the dean of men.** The office of Dean of Men was created at the beginning of the academic year 1924-25, with no definite instructions as to functions. Wherever possible, the Dean has sought to act in an advisory capacity to every interest of the student body desiring that relation. The most important work has been the many personal conferences with the men students on their various problems. As nearly as the functions can be specifically enumerated, they are as follows:

1. Confer with men on any problem on which they seek advice.
2. Supervise men's organizations, such as fraternities and clubs.
3. Advise with the freshman class for organization and activity purposes for the year.
4. In a general way, to advise with all classes and officers of the student body.
5. Serve as chairman of the Student Interests Committee, having general supervision of student body affairs other than student activities involving student body finance.

**Housing men.** The total number of men for the year 1924-25, September to June, was 2,259, and for the year 1925-26, 2,410. These include regular students on the campus only, and have no relation to short course or summer session students. Approximately 50 percent of the men are members of fraternities. About 95 percent of the fraternity men live in the fraternity houses. The other men of the student body live for the most part in private homes. An average of 125 live in the Men's Dormitory. There are 35 fraternity houses near the College campus, and on the campus one dormitory building, which was erected and used as a barracks building during the war.

**Independent men.** Men students who are not members of fraternities are organized into clubs. The men in the dormitory are divided into groups forming permanent clubs. The city is districted, and the men living in the respective districts are organized into clubs. The presidents of the clubs are organized into the Independent Student Council. These legislate for their members and administer the regulations. The independent men's clubs have made marked progress in organization during the past year, and have been a genuine assistance to their members, aiding them in social and scholastic work. A more closely knit organization, with faculty advisers for each club, is the aim. During the past year the independent students of the College and the independent students of the University of Arizona have started a movement for a national organization of independent students.



The great need for the independent men is a first-class dormitory. Such a building would be the rallying center for this large portion of our student body, and would undoubtedly improve the spirit of the student body as a whole.

**Fraternities.** Fraternities are governed by general College regulations and regulations of the Interfraternity Council. This Council consists of one representative from each organization. The Council meets once a month or oftener to consider problems common to the fraternities. As far as possible, the aim is to make the body self-governing. The regulations cover pledging, initiation, scholarship, and related matters. The Council is both legislative and administrative, punishing its member organizations in case of violation of the regulations. Meetings of the faculty advisers are called at various times to discuss current fraternity problems. Each fraternity must have a faculty adviser to aid the organization and the College in securing the desired results.

The location, plans, and cost of all fraternity houses must be approved by the Housing Committee of the College. The primary aim of the College is to provide comfortable and pleasant homes, but to keep the cost within the range of the financial ability of the average student.

**Social life of the institution.** The social events of the student body are held by the student body itself, the different classes, social clubs, sororities, and fraternities. These different organizations schedule and hold their events under regulations adopted by themselves, the Student Interests Committee, and the College. The immediate scheduling of events is in charge of a subcommittee of the Student Interests Committee, headed by the Associate Dean of Women. The immediate supervision of the social events is in charge of the office of the Dean of Women. No organization may schedule social events except on week-ends and days preceding holidays. Each month one week-end is kept open for general college events, and no social organization may schedule social events. Likewise the week-end preceding examination week is closed to social events. No organization falling below the grade of 83 for the average of its membership for a term is permitted to hold social events the succeeding term.

**Cost of social events.** Clubs, sororities, and fraternities have adopted regulations limiting the cost of social events, definitely providing a maximum for their major events of \$5.00 per member. These organizations provided in their regulations for an Auditing Committee, consisting of one member each from the Independent Student Council, Pan-Hellenic, and Interfraternity Council, appointed by the Student Interests Committee. After each event the organization holding the event must present an itemized statement, accompanied by receipts. This account is audited by the Auditing Committee. During the past college year, these organizations (64 in number) held a total of 229 events. The average cost per function was \$59.30, and the average cost per member for each event during the year was \$1.78. Many events were informal, costing only 75c per member. The attendance at these functions is from two to three times the membership. Recognizing this fact, one sees that the expense of the functions per person in attendance is very low. The desire of those assisting in this work is to encourage wholesome enter-

tainment on the campus at a cost within the reach of the average student.

**Class organizations.** The Dean of Men acts in an advisory capacity for all activities of the freshman class. He seeks to be present at all meetings and to help the class to find its place and function on the campus. He acts in a much less close relation to the other class organizations, advising in a general way about their functions and finance. The class funds of the four classes are kept in the Business Office of the College. They can be drawn out by the treasurer of the class only on requisition approved by the President of the class and either the vice-president or the secretary. All bills are approved by the president and secretary or vice-president of the class involved. The books of all the classes are audited by the College auditor.

**Student discipline.** The discipline of the students is shared by various organizations. As far as possible the College is giving the discipline over to the student organizations themselves. Students violating the Honor Code are tried by the Honor Court consisting entirely of students with a faculty adviser. Many of the discipline cases affecting men go to the Student Council consisting of representatives of the Student Body and representatives of the various class organizations. Other cases of discipline are handled by the Dean of Men. All actions of these various bodies involving discipline must be approved by the President of the College.

**Student Interests Committee.** The Student Interests Committee consists of 6 students and 5 faculty members. All become members of the Committee ex-officiis. The student members consist of the President of the Associated Students, Editor of the Barometer, President of the Independent Student Council, President of the Interfraternity Council, President of Pan-Hellenic, and President of the Associated Women Students. The faculty members are the chairman of the Housing Committee, chairman of the Scholarship Committee, Director of Physical Education for Men, the Dean of Women, and the Dean of Men. It will be seen that practically every interest of the student body is represented, from the point of view of both faculty and students. This Committee legislates chiefly for social affairs of the student body, though it gives consideration to all of the student interests, hence the presence of the chairman of the Scholarship Committee, the chairman of the Housing Committee, and the Director of Physical Education, as well as the Dean of Women and the Dean of Men.

**Correspondence with students and parents.** The first approach to incoming freshman men is made by means of a form letter which is personal in character. The letter not only welcomes the student but tells a bit about the service of the office. In the same letter is enclosed a folder entitled "Tips to Freshmen," giving freshmen advice about some of the first problems that will confront them. Among these are choice of rooms, choice of friends, attitude to fraternities, faculty, and organizations on the campus. After registration is completed we have written a letter to the parents of each freshman man offering the services of the office for any help that may be given to freshmen. Throughout the year

a great number of letters are received from parents about the boys and their work. This correspondence forms an important part of the work of the office, maintaining the contact between the institution and the home.

**Other functions of the office.** The Dean of Men is head of the Political Science department in the School of Commerce, and has taught one or two classes each term. He is scheduled for one class each term this year. He is a member of the Scholarship Committee, member of the Y. M. C. A. Advisory Board, and Chairman of the Committee on Student Interests. He gives a considerable number of addresses to high schools, commencements, and civic bodies.

The entire work of the office is handled by the Dean of Men and his secretary, Miss Edith Wilkinson.

Respectfully submitted,

U. G. DUBACH,  
Dean of Men.



# REPORT OF THE DEAN OF WOMEN

To the President of the College,

Sir: I have the honor of submitting to you the report of the Dean of Women for the biennium ending June 30, 1926.

**Student life.** During the past biennium there were registered at this College 1,112 and 1,183 women students respectively. The three residence halls, Cauthorn, Waldo, and Margaret Snell, are inadequate, of course, to accommodate all these women. Supplemented, however, by the sixteen sorority houses, these halls provide adequate facilities for comfortable living for the young women without the necessity of deviating from the College policy which forbids women students from living elsewhere than in College-controlled houses unless they are working for room and board. On the other hand, the policy that freshman girls should spend at least one year in the halls of residence was not fully complied with. Due to the fact that many students do not return for their four successive college years, there is an unusually large turnover in sorority houses. This is largely due to the fact that the College is a technical institution and young women obtain sufficient training in one or two years to enable them to earn money. In order to help solve the financial problem of the sorority houses which naturally results from this condition, as well as to reduce congestion in the halls of residence, it has been necessary to permit sufficient freshman girls to live in the houses in order to make up a sufficient number of residents in each sorority house to insure economic living. The budget system, which has been so admirably worked out under the direction of Professor A. Grace Johnson, provides the College with definite information as to what constitutes an economic residence minimum for a sorority house. Under this system all managers meet regularly with Miss Johnson, who has worked out with them a uniform budget of expenditures. The cost of running the house, the indebtedness of the house, and the savings necessary for the building of new houses, have been considered and on this basis the number of young women required to meet these expenditures has been standardized for each house. As a result of this plan we are not in danger of granting special favors to certain houses and we are able to state definitely the cost of sorority living as well as to curb undue or unnecessary expenses. I cannot commend too highly Miss Johnson's work on this committee. It is attracting the notice of college presidents and deans of women in the entire country. I should desire, however, that we go one step further and that we try to help the sororities in supervising the meals so that there may be no danger of foolish economy in order to provide social luxuries. In order to do this, however, it would be necessary to give Miss Johnson added time. Should it be possible to relieve her of one teaching hour it would be of great benefit.

**Student self-government.** During the past year a very definite effort has been made to develop self-government in the halls. Under this plan a council chosen by the residents of the hall takes care of all violations of College regulations. It also attempts to develop standards and ideals



for the house. The president keeps in close touch with the preceptress, reporting to her after each meeting the complete proceedings. So far, the results of the experiment have been very satisfactory. Students are taking more pride in their halls of residence, with the result that the discipline has been greatly improved. Because of the success of this undertaking with the residence halls, a similar plan is under way with the sororities. Presidents of the sixteen sororities meet regularly the first and third Monday of every month for the purpose of carrying out the same form of self-government as well as unifying the social conduct and management of all houses. The results of these meetings are carried to the house meeting on the same evening. On the Wednesday following the Dean of Women has the opportunity of presenting the same things to the housemothers at their regular semimonthly meeting.

**Student social life.** One of the most difficult departments of the work of the Dean of Women is the supervision of social life. Miss Livingston, as chairman, tried for one year to direct this work alone. Because, however, of the many angles to the problems and the large number of students involved it seemed best to appoint a special committee to aid in conducting this work. With the approval of the Student Interests Committee a subcommittee on Social Life was formed with Miss Livingston as chairman. One member (male) of the faculty and three students chosen from the upper classes form the committee. They meet regularly every Wednesday at 12:45 for the approval of applications for social functions, and semimonthly on Monday for the purpose of developing policies under which the social life of the College shall be conducted. These results are always presented to the Student Interests Committee for approval.

The standardization of this phase of the Dean's work has been very satisfactory and has resulted in developing on the part of students a sense of responsibility toward the College for recreation. This work forms only a small part of Miss Livingston's duties, and it is carried on with the same conscientiousness and disinterestedness that characterizes all of her work and makes her an exceptional officer in this department of the College.

**Student self-help.** The department of self-help for girls has for the past two years been under the efficient guidance of Miss Jewell Godfrey, secretary to the Dean of Women. During the year 1925-26, 491 girls, or 43 percent of the total enrollment for girls, were self-supporting. Of this number 245 were earning part or all of their expenses while attending college. During the first week of the academic year Miss Godfrey interviewed forty-five applicants and placed twenty girls in private homes to work for board and room, six in permanent office positions, seven in waitress, library, and clerking positions, and fifteen in various odd jobs. As many as forty calls a week have come in for girls to fill odd jobs. More than one hundred letters of application for part-time work were received and answered this past summer.

**Service to the commonwealth.** In addition to the residence work, conferences, committees, and organizations, which take the time of the Dean of Women on the campus, I have visited fifty high schools in Oregon, speaking in fifteen more than once, have attended five girls'

week banquets, have participated in seven conferences of the Parent-Teacher Association and the Federated Clubs, and addressed twenty meetings of women. The wide contacts made in this way seem most helpful, as they give me an understanding of the girls and the homes and communities from which they come, as well as make it possible for the mothers of student women to have personal access to one person who is responsible for the happiness and success of their daughters in college.

On the whole the work for which the office of the Dean of Women has been responsible for the past biennium has been quite satisfactory, due to the excellent support rendered by the Associate Dean of Women, Miss Livingston, and the secretary, Miss Godfrey. A special effort is made to meet and to understand the individual students and their problems. At no time is a student turned away. On the contrary every possible effort is made to encourage her to bring her personal problems to this office. As a result of these intimate contacts it has been impressed upon me that one great need of this College is a woman physician. With more than one thousand women registered, the money paid by them for the health service would, it seems to me, justify them in urging the appointment of a woman physician to whom girls could talk freely about their own intimate problems, who would understand young women's natures, and who would be of unusual help in the Physical Education department. A part of the work of such an officer would be to give courses in social as well as physical hygiene in the department of Physical Education. This knowledge is very much needed and desired by girls and should be given by a person scientifically trained.

Respectfully submitted,

(MRS.) K. W. JAMESON,  
Dean of Women.

# REPORT OF THE LIBRARIAN

To the President of the College,

Sir: I have the honor to submit the following report on the progress of the Library for the biennium July 1, 1924 to June 30, 1926.

**Organization and policy.** No changes were made in the general organization of the work during the biennium, the work being still carried on under five distinct departments: the Executive and Order department, the Cataloguing department, the Circulation department, the Reference department and the Technical department. Some minor changes have been made in methods and policies with a view to improved service. Results in most cases have been favorable.

The most important advancement was made by changing the method of charging books from the "Illinois system" to the "Newark system." This necessitated remodeling the loan desk, placing book pockets in all books that circulate, typing two cards for each book, and some other clerical detail. Work was begun in January, 1926, and was completed during the summer, ready for installation at the opening of the fall term, 1926. Before the change was decided upon, tests were run which showed that a marked saving in time, as well as elimination of unnecessary routine and waste of material would be accomplished by the change.

**Library Practice course.** A one-credit course in the use of the Library was offered each term. Its purpose was to familiarize freshmen with our library facilities, and included practical instruction in the use of catalogues, indexes, and reference books. The preparation of a bibliography to be used in connection with some other course was required.

The instructional work was done by two members of the Reference department and one member of the Technical department. During the biennium 1,398 students took this course.

**Staff.** The regular staff of the Library was increased from thirteen to fifteen during the biennium. With the exception of the order clerk, who has a thorough business college training, these staff members were all college graduates with one or more additional years of special library school training and with experience fitting them for the special work in our Library.

The staff suffered distinct losses during the biennium when members resigned to accept positions at higher salaries. Among these were two heads of departments.

From fifteen to twenty students were given employment each term at clerical and mechanical work not requiring special library training. This policy had two advantages: economy for the Library; assistance to students who found it necessary to earn part or all of their expenses while in College.

**Service.** The monthly reports of the heads of the Library departments show a normal increase in circulation, and a very marked increase in reference calls and bibliographic requests. In the Reference department alone, 17,616 reference calls were answered, many of these requir-



ing hours of search. A large number of similar calls were cared for in the Technical department.

Many bibliographies were prepared. Some of the most important were: "Cooperative marketing," consisting of 650 entries; "Forestry," consisting of 563 entries; a biweekly reading list of ten or fifteen books on financial questions; and a large number of briefer bibliographies on scientific topics or questions of current interest.

The Picture collection has been increased from 275 mounted pictures to 751, and a large number of unmounted pictures were added to the collection. A very important service was the indexing of these pictures.

One of the most significant pieces of cooperative bibliographical work in which we have had a share is the preparation of a National Union List of Serials in the leading libraries of the United States and Canada. Only two other libraries in Oregon are represented in this list.

We have also checked the list of publications to be abstracted in "Biological Abstracts," showing what literature is to be found in this library. A similar service was done for "Chemical Abstracts" and the "Checklist of Northwest Americana."

Previously established indexes which have been kept up to date are the "Short Story Index," the "Drama Index," the "Essay Index," and the "Index to the Barometer."

The most important publication of the department was the "List of Serials in the Oregon Agricultural College Library, November 1, 1925." Requests for this list have been filled from every state in the Union.

A series of monthly Book Chats and thirteen lectures on book subjects were given by members of the Library staff over the College Radio Station KOAC last year.

Special book exhibits were prepared for the State Fair, the Educational Exposition, and Children's Book Week. Smaller exhibits were made in the Library biweekly throughout the biennium.

Two members of the staff have held important offices and had parts on programs in both annual meetings of the American Library Association and the Pacific Northwest Library Association.

Book talks were also given by members of the Reference department to parent-teacher associations, mothers' clubs, and women's clubs, and story telling programs were provided for the Boys' and Girls' Clubs conference held on the campus in June.

A system of circulation of important technical periodicals and other current material to the Branch Experiment Stations was inaugurated. The plan used is similar to that used for departmental workers on the campus.

Means of filling in many missing numbers of back sets of valuable serials and periodicals was provided by the sale or exchange of duplicates.

**Facilities.** Conditions have not greatly changed during the biennium, although certain important and necessary items of furniture and equipment have been added each year. A self-supporting ink filling station was installed for convenience of the students, and many minor improvements have been made for giving quicker and better service.



Plans were approved last spring for making important changes in the Circulation department for the beginning of the coming biennium, when the card catalogue will be moved into the hall and an additional loan desk installed, separating the general circulation from the reserve books.

**Acknowledgments.** The Library has been the recipient of numerous valuable gifts of books and periodicals from local friends and from friends from all over the state. While space does not permit the listing of all of these gifts, the following are typical of a few of the gifts that have been received: 242 volumes from the estate of the late Bishop Robert L. Paddock; about 2,000 bound documents and unbound periodicals and books from E. R. Lake (member of faculty in early days of the institution).

The Library was also made the depository for a mural painting by Professor J. Leo Fairbanks, presented by the class of 1924.

**Needs.** A review of the work of the Library during recent years indicates that the growth of the College and the attendant increased demand for library service have greatly exceeded the increase in our means and facilities for meeting these demands. We always need more books and magazines than we have when any special subject is under investigation.

There are many missing numbers in scientific sets of periodicals and transactions of societies that are frequently requested by research workers. Each year we fill in as many of these sets as our limited funds permit, but they are usually unbound, and in no condition for use or circulation until bound. If we purchase the material we have no funds left for binding much of it. If we do not purchase it, it becomes out of print and almost impossible to secure later, so we must buy as much as we can and shelve it unbound. But the unbound material takes up much more space on the shelves, and we are rapidly becoming cramped for shelving space. We are in urgent need of more money for the purchase and binding of scientific sets.

We can not supply the actual needs of the schools of Commerce, Engineering, Home Economics, and Basic Arts and Sciences for current books. Valuable new scientific periodicals, abstracts, and reference books come out each year that we do not have funds to secure or sufficient staff in the Order and Cataloguing departments to order and catalogue if we could secure them. At present we have one order clerk and one cataloguer, with one assistant working half time in each department. They can not keep up with the present demands of the work. We should have an additional assistant in the Order department, releasing the present assistant to do full time work in the Cataloguing department.

Eight years ago a fine new Library building was provided for our use. It was believed then that it would be adequate for our needs for a great many years. The College has grown much more rapidly than could have been anticipated, but this building would be adequate for some years yet, if all or most of it could be at our disposal. Our need for a reserve book reading room and additional office work room has been explained too fully in other reports to need more than mention here.

The present reading rooms are so overcrowded and noisy, because of the attempt to handle reserve books and regular circulation in the same room, that they are no longer quiet places for concentrated work. Partial temporary relief has been provided for next year by removing the catalogue to the main hall, and installing separate desks for reserve books and general books. The improved service thus provided will be appreciated, but it will not relieve congestion and noise due to handling reserve books in the main reading room.

We have a constantly growing demand for maps, and no place to display or use them.

In cooperation with the various states, the Bureau of Agricultural Economics of the United States Department of Agriculture is preparing Source Books of Agricultural Statistics in the various states. These are very valuable indeed and our workers in both the Experiment Station and the Extension Service have expressed the desire that we urge the early preparation of the Oregon bibliography.

Owing to limited staff the Bureau is taking up first the states that can cooperate in the work. Alabama, California, and Oklahoma have already done the work on theirs. We should get ours under way as soon as possible.

**Recommendations.** (1) A substantial increase in the fund for books, periodicals, back sets, and binding.

(2) Provision for an assistant for Order department, releasing present half-time assistant for full-time work in cataloguing.

(3) Release of the rooms in the basement and on first floor now occupied by the Museum, the Dean of Women and as classrooms, to the Library for use for reserve book rooms, office work rooms and map room.

(4) Setting back the partition between delivery room and hall so as to make room for the loan desk opening into the hall, eliminating noise in the reading room. The present loan desk could be moved, and wall shelving placed where it now stands.

(5) Sending of one of our staff to the Bureau of Agricultural Economics Library for one month to cooperate in the preparation of a Source Book for Agricultural Statistics of Oregon.

Respectfully submitted,

LUCY M. LEWIS,  
Librarian.

# REPORT OF THE REGISTRAR

To the President of the College,

Sir: The purpose of this report is to present data dealing with student enrollment and related subjects for the biennium ending June 30, 1926. These data have been analyzed under four divisions as follows:

1. Number of students registered.
2. Geographical distribution of residence.
3. Information relating to character of student body.
4. Number and distribution of degrees conferred.

## NUMBER OF STUDENTS REGISTERED

During the period under review the College has experienced a most satisfactory growth, the total enrollment on June 30, 1926, representing an increase of twelve percent over the corresponding total at the close of the preceding biennium. No abnormal conditions have affected attendance, the growth resulting from the increased number of high school graduates in the state and interest in education generally. It may be safely predicted that this growth will continue at approximately the same rate during the next period.

The work of the United States Veterans' Bureau, which has been an important factor in enrollment since 1919, has been completed, so far as this institution is concerned. The standard entrance requirements are rigidly enforced and a high grade of scholarship is consistently maintained.

The tables given below analyze the enrollment, comparing in detail the two years of the biennium.

### ENROLLMENT BY SESSIONS

	1924-25	1925-26
Full year courses .....	3371	3593
Summer session .....	880	1146
Short courses .....	300	450
Totals.....	4551	5189

### CLASSIFICATION OF STUDENTS ENROLLED

	1924-25	1925-26
Graduate .....	51	57
Regular undergraduate .....	3190	3435
Special .....	130	101
Totals.....	3371	3593

## ENROLLMENT IN FULL YEAR COURSES

Course	1924-25			1925-26		
	Men	Women	Total	Men	Women	Total
Agriculture	347	8	355	307	8	315
Optional	8	12	20	13	20	33
Commerce	728	330	1058	782	357	1139
Engineering				225	1	226
Civil Engineering	125		125	96		96
Electrical Engineering	291		291	191		191
Industrial Arts	81		81	76		76
Mechanical Engineering	140		140	83		83
Forestry	154		154	147		147
Home Economics		455	455		491	491
Mines	39		39	44		44
Chemical Engineering	77	1	78	83	2	85
Pharmacy	153	39	192	180	35	215
Vocational Education	75	239	314	137	229	366
Military Science and Tactics	5		5	8		8
Music	2	11	13	4	17	21
Graduate	34	17	51	34	23	57
Totals	2259	1112	3371	2410	1183	3593

## ENROLLMENT AS TO CLASSES

	1924-25	1925-26
Freshman	1174	1323
Sophomore	1367	1490
Junior	164	171
Senior	485	451
Graduate	51	57
Special	130	101
Totals	3371	3593

## SUMMER SESSION ENROLLMENT

Regular course			
Men	180	294	
Women	293	371	
		473	665
Boys' and Girls' Clubs			
Boys	178	204	
Girls	218	249	
		396	453
Non-collegiate courses		11	28
Totals		880	1146

## GEOGRAPHICAL DISTRIBUTION OF RESIDENCE

As has been the case for several years, the enrollment consistently includes representatives from every county (36) in Oregon, from many different states, and from several foreign countries. The non-resident tuition fee, however, which has been in operation at the present rate of \$150 per year since September, 1923, still continues to check the number of students who would otherwise come from other states. Nevertheless, the number of students transferring from institutions located in other states and coming here with one or more years of advanced standing is gratifying.



## REGISTRATION FROM COUNTIES OF OREGON

Counties	1924-25 Summer Session and Short Courses			1925-26 Summer Session and Short Courses		
	Regular courses	Short Courses	Total	Regular courses	Short Courses	Total
Baker .....	30	4	34	34	4	38
Benton .....	959	400	1359	981	389	1370
Clackamas .....	83	23	106	90	40	130
Clatsop .....	58	8	66	63	20	83
Columbia .....	47	3	50	46	17	63
Coos .....	85	10	95	71	18	89
Crook .....	5	1	6	4	.....	4
Curry .....	4	10	14	2	5	7
Deschutes .....	21	2	23	28	5	33
Douglas .....	82	25	107	97	34	131
Gilliam .....	15	1	16	13	.....	13
Grant .....	12	.....	12	12	1	13
Harney .....	6	3	9	8	1	9
Hood River .....	28	6	34	34	8	42
Jackson .....	64	47	111	71	37	108
Jefferson .....	8	1	9	11	3	14
Josephine .....	23	22	45	27	24	51
Klamath .....	31	82	113	35	80	115
Lake .....	34	1	35	31	.....	31
Lane .....	80	33	113	96	35	131
Lincoln .....	17	5	22	21	21	42
Linn .....	116	57	173	115	53	168
Malheur .....	44	8	52	34	8	42
Marion .....	136	55	191	145	78	223
Morrow .....	16	1	17	21	2	23
Multnomah .....	732	121	853	786	338	1124
Polk .....	42	11	53	48	26	74
Sherman .....	18	9	27	22	8	30
Tillamook .....	20	24	44	24	21	45
Umatilla .....	79	15	94	102	17	119
Union .....	44	7	51	49	11	60
Wallowa .....	19	4	23	24	1	25
Wasco .....	37	3	40	40	7	47
Washington .....	61	33	94	55	43	98
Wheeler .....	4	.....	4	7	.....	7
Yamhill .....	74	11	85	64	17	81
Totals .....	3134	1046	4180	3311	1372	4683

## REGISTRATION FROM OTHER STATES

States	1924-25 Summer Session and Short Courses			1925-26 Summer Session and Short Courses		
	Regular courses	Short Courses	Total	Regular courses	Short Courses	Total
California .....	107	45	152	158	50	208
Idaho .....	17	7	24	13	25	38
Montana .....	7	7	14	2	18	20
Washington .....	70	50	120	65	85	150
All other states .....	20	20	40	22	37	59
Totals .....	221	129	350	260	215	475

## REGISTRATION FROM FOREIGN COUNTRIES

Countries	1924-25 Summer Session and Short Courses			1925-26 Summer Session and Short Courses		
	Regular courses	Short Courses	Total	Regular courses	Short Courses	Total
Africa .....	1	.....	1	.....	.....	.....
Canada .....	7	4	11	9	5	14
China .....	1	.....	1	7	2	9
India .....	3	.....	3	1	.....	1
Japan .....	.....	.....	.....	1	1	2
Jugo-Slavia .....	1	.....	1	1	.....	1
Korea .....	1	.....	1	1	1	2
Peru .....	1	1	2	.....	.....	.....
Russia .....	1	.....	1	2	.....	2
Totals .....	16	5	21	22	9	31

## SUMMARY

Oregon .....	3134	1046	4180	3311	1372	4683
Other states .....	221	129	350	260	215	475
Foreign countries .....	16	5	21	22	9	31
Grand totals .....	3371	1180	4551	3593	1596	5189

STATES, AND NUMBER OF COLLEGES AND UNIVERSITIES REPRESENTED  
BY STUDENTS TRANSFERRING TO O. A. C.

State	1924-25		1925-26	
	Number of institutions	Number of students	Number of institutions	Number of students
Arizona .....	...	...	2	2
Arkansas .....	1	1	...	...
California .....	21	65	21	46
Colorado .....	3	5	1	1
District of Columbia .....	...	...	1	1
Idaho .....	4	9	5	9
Illinois .....	6	7	2	2
Indiana .....	1	2	1	1
Iowa .....	1	1	2	8
Kansas .....	1	1	4	4
Maryland .....	...	...	1	1
Massachusetts .....	1	1	...	...
Minnesota .....	1	1	1	2
Mississippi .....	1	1	...	...
Missouri .....	3	5	2	3
Montana .....	1	5	2	4
Nebraska .....	2	4	3	4
North Carolina .....	1	1	...	...
New Mexico .....	...	...	1	1
New York .....	...	...	1	1
North Dakota .....	...	...	1	1
Ohio .....	2	3	...	...
Oklahoma .....	1	1	...	...
Oregon .....	11	67	11	93
Pennsylvania .....	1	1	1	1
South Carolina .....	1	1	...	...
South Dakota .....	1	1	1	1
Tennessee .....	1	1	1	1
Texas .....	...	...	2	2
Utah .....	1	1	2	2
Washington .....	9	35	8	55
Wisconsin .....	2	4	1	1
Canada .....	1	2	...	...
Hawaii .....	1	2	...	...
China .....	2	2	...	...
India .....	1	1	...	...
Korea .....	1	1	...	...
Philippines .....	1	1	...	...
Syria .....	1	1	...	...
Totals .....	86	234	78	247

INFORMATION RELATING TO CHARACTER  
OF STUDENT BODY

The scholastic status of the student body continues to be highly satisfactory as indicated by the tables below. Institutional regulations have consistently required students to do a high grade of work, and during the biennium two pieces of legislation have been enacted which operate to place upon a still higher plane the character of work done. Beginning with the class entering in September, 1925, a grade point system became operative. The effect of this regulation is to require a grade average of "C" to qualify for graduation, thus eliminating those students who get only passing grades. For several years the "C" grade has been the stu-

dent body average. In the future a student who fails to maintain this average during his four years in college will not be graduated. Another regulation which has promoted regularity and efficiency in scholarship is the junior certificate requirement. Under this rule a student must complete all of the requirements in the first two years of any curriculum before junior standing may be obtained.

The Scholarship Committee, composed of seven members of the faculty, still continues to function most satisfactorily. This committee devotes much time to promoting a high grade of work, and gives particular attention to those students who are falling below the requirements. All cases of poor scholarship are reviewed with the aim of determining causes and rendering assistance. Students who do not bring about improvement in a reasonable time, or present satisfactory reasons for continued deficiencies, are promptly eliminated from the institution.

Fraternities, sororities, and other house organizations are required to maintain organization averages approximately equal to the scholastic standing of the entire student body. Violations of this regulation result in enforcement of probation rulings, and repeated delinquencies may result in the disbanding of the organization.

That the student body as an organization is enthusiastically supporting the administration in the cause of the high standard of scholarship, is indicated by the action of the student assembly in adopting the Honor System and putting it into effective operation. The institution has been working under the honor code for more than two years, and results therefrom have been highly satisfactory.

In addition to the high degree of scholarship maintained, the industry of the student body is indicated by the number of both men and women who are either entirely or partly self-supporting. The proportion of students supplying all of the funds needed for their education is unusually large. Many of these students find it possible to earn a considerable part of the year's expenses while in regular attendance. Such earnings, together with regular vacation periods, and possibly by missing a term, or even a year, now and then, make possible the financing of the entire educational program.

#### SCHOLARSHIP RATINGS

	1924-25	1925-26
First Term		
Student body average .....	82.76	82.64
All men .....	82.02	81.92
All women .....	84.24	84.17
Men in fraternities .....	84.50	84.83
Men not in fraternities .....	80.82	80.67
Women in sororities .....	85.52	86.28
Women not in sororities .....	83.79	83.47
Second Term		
Student body average .....	83.67	83.71
All men .....	82.83	83.30
All women .....	85.41	84.59
Men in fraternities .....	84.97	85.33
Men not in fraternities .....	81.38	82.07
Women in sororities .....	86.49	86.37
Women not in sororities .....	84.84	83.68
Third Term		
Student body average .....	84.56	84.55
All men .....	84.13	84.26
All women .....	85.43	85.11
Men in fraternities .....	85.52	85.97
Men not in fraternities .....	82.98	82.94
Women in sororities .....	86.66	86.68
Women not in sororities .....	84.58	84.07

## PERCENTAGE OF SELF-SUPPORTING STUDENTS

	1924-25 Percent	1925-26 Percent
<b>Men</b>		
Entirely self-supporting .....	55	52
One-half or over, but not entirely .....	30	31
Partly, but less than one-half .....	9	11
Dependent .....	6	6
<b>Women</b>		
Entirely self-supporting .....	24	23
One-half or over, but not entirely .....	14	14
Partly, but less than one-half .....	12	13
Dependent .....	50	50
<b>Student body</b>		
Entirely self-supporting .....	45	43
One-half or over, but not entirely .....	24	25
Partly, but less than one-half .....	10	11
Dependent .....	21	21

## AVERAGE AGE OF STUDENTS

	1924-25	1925-26
Freshmen .....	19.42	19.62
Sophomores .....	21.39	21.40
Juniors .....	21.89	21.40
Seniors .....	23.24	23.47
Specials .....	25.61	26.43
Graduates .....	26.32	29.33
Student body .....	21.17	21.26

NUMBER AND DISTRIBUTION OF DEGREES  
CONFERRED

The graduating class of 1925 numbered 497, and in 1926 476 were awarded degrees. The number and distribution of these degrees and diplomas is set forth below.

## DEGREES CONFERRED AND DIPLOMAS AWARDED

Degrees	—1924-25—	—1925-26—
Master of Science .....	8	10
Bachelor of Science:		
Agriculture .....	78	81
Commerce .....	104	109
Engineering:		
Civil Engineering .....	18	15
Electrical Engineering .....	43	40
Industrial Arts .....	12	13
Mechanical Engineering .....	22	24
Forestry .....	95	92
Logging Engineering .....	12	9
Home Economics .....	3	6
Mines .....	84	67
Chemical Engineering .....	10	5
Pharmacy .....	11	13
Vocational Education .....	24	10
Graduate in Pharmacy .....	51	57
Pharmaceutical Chemist .....	472	449
Music Diploma .....	2	16
Total .....	1	1
	497	476



## DEGREES CONFERRED JUNE 8, 1925

## BACHELORS OF SCIENCE

## SCHOOL OF AGRICULTURE

*Agricultural Chemistry*

MORTON FREEMAN MASON  
Pasadena, California

*Animal Husbandry*

REUBEN ALBAUGH  
McArthur, California  
GARNET DOUGLAS BEST  
Corvallis, Benton  
VERNON MELVIN BUTLER  
Ontario, Malheur  
JAMES MASON COON  
Gooding, Idaho

LEWIS GORDON CRAM  
Corvallis, Benton  
HUXLEY LYELL GALBRAITH  
Corvallis, Benton  
HUGH DAVID GOOD  
Lemon Grove, California  
LEWIS EDWIN RECTOR  
Seattle, Washington State

ROLAND EPES SIMMS  
Emelle, Alabama

*Botany*

EVA VIOLET LUEDINGHAUS  
Vancouver, Washington State

*Botany and Plant Pathology*

FRANK ALEXANDER PATTY  
La Grande, Union

*Dairy Husbandry*

JOHN EDWARD BLINKHORN  
Corvallis, Benton  
ERNEST SIVITER BRUCE  
Corvallis, Benton  
EMILE CHRISTENSEN  
Portland, Multnomah  
EBEN LAMONTE CONNER  
North Bend, Coos  
SAMUEL TODD COULTER  
Cascade, Idaho  
LESLIE FRANKLIN CUTRIGHT  
Corvallis, Benton

RILEY BURNETT EWING  
Mount Vernon, Washington State  
RICHARD WALLACE GRAY  
Calistoga, California  
THEODORE HOBART  
Silverton, Marion  
FREDERICK CHRISTIAN KLAUS  
Salem, Marion  
CLARENCE LEE LOCKHART  
Corvallis, Benton  
WITTMER MACDONALD  
Hillsboro, Washington

RICHARD ALEXANDER NIXON  
Oregon City, Clackamas

*Entomology*

DAVID DUNAVAN  
Corvallis, Benton

DONALD ALDEN WILBUR  
Corvallis, Benton

JOSEPH WILCOX  
Corvallis, Benton

*Farm Crops*

ORVA EDWARDS DYER  
Mayville, Gilliam  
RALPH IRVIN HALE  
Corvallis, Benton  
DONALD DAVID HILL  
Eugene, Lane

ROY LIDSTER HOLMAN  
Mt. Carroll, Illinois  
KENNETH COLLINS MECKLEM  
Portland, Multnomah  
EARL CLIFFORD REINHART  
Corvallis, Benton

*Farm Management*

FRANKLIN EDGAR GILKEY  
Scio, Linn  
WILBUR IRWIN LARMER  
Covina, California

ALVIN REETZ  
Junction City, Lane  
CHARLES PATRICK SHINKWIN  
Corvallis, Benton

*General Agriculture*

JOHN DE ALIAGA Lima, Peru	MANUEL LLABRES Philippine Islands
CECILIO CARBONELL AREOLA Iligan, Lanao, Philippine Islands	JOHN ALLISTER McDONALD* Nyssa, Malheur
RALPH OWEN BAKER Newberg, Yamhill	DAVID ANDREW PFEIFFER Walla Walla, Washington State
FRANK LESLIE HOWARD Corvallis, Benton	LINDSEY HILL SPIGHT Hood River, Hood River
DALE VIVIAN LEEVER McMinnville, Yamhill	REUBEN FRED SPRING Milwaukie, Clackamas
FRED RUSSELL LEWIS Corvallis, Benton	SOLOM TAYLOR WHITE Corvallis, Benton

*Horticulture*

KENNETH JUSTICE ACKLEY Chapman, Columbia	LESTER ORR MATTHEWS Los Angeles, California
EDGAR PERCY BERG Nooksack, Washington State	SAMUEL MERRILL, JR. Pasadena, California
ALTON HAROLD FINCH Bishop, California	ELWOOD ELLIS PICKERING Reseda, California
CHARLES PIEMONT GERHART San Bernardino, California	ANDREW WILLIAM SHERWOOD Portland, Multnomah
GEORGE STEINER MASON Ashland, Jackson	WALTER LEE WORTHY Corvallis, Benton

*Horticultural Products*

SATYA DEVA LOOMBA\*  
Corvallis, Benton

*Horticulture—Landscape Gardening*

MARK HENRY ASTRUP Seattle, Washington State	HENRY BENJAMIN DOLTON Hollywood, California
VERNA PETERSON Corvallis, Benton	

*Horticulture—Vegetable Gardening*

ROBERT RALPH CLARK  
La Grande, Union

*Markets and Marketing*

FLOYD EDGAR ANDRES Garden Grove, California	BENJAMIN HARRISON LUEBKE Corvallis, Benton
OSCAR KITTREDGE Silver Lake, Lake	DEAN WOODS MICKELWAIT Twin Falls, Idaho
ROBERT STIMPSON LIVINGSTON Oxnard, California	EMIL JAMES SMITH Albany, Linn

*Poultry Husbandry*

JOHN DANIEL CURRAN Portland, Multnomah	WILLIAM PATRICK MULLIGAN Seattle, Washington State
JERRY WILKINS DeCOU, JR. Corvallis, Benton	EARL REITSMA Corvallis, Benton
HERBERT VON LEHE Corvallis, Benton	

*Soils*

CONSTANTINE ATHANASIO APOSTOLIDES Portland, Multnomah	RAY MCCART McMinnville, Yamhill
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\*Degree granted at close of 1924 Summer Session.

## SCHOOL OF COMMERCE

CHARLES EDWIN ALLISON Portland, Multnomah	EARL SIDNEY GRIFFIN Middleton, Idaho
WHITNEY COX ALLYN Grants Pass, Josephine	KENNETH HAROLD GRUBBE Corvallis, Benton
HELEN ANDRESEN Oregon City, Clackamas	LUCIAN JOSHUA HALL Corvallis, Benton
LILLIE ROWENA ASBURY McMinnville, Yamhill	CARROLL EVERETT HAMLIN Corvallis, Benton
MYRTLE MARGARET BALLF Roseburg, Douglas	DORA ISABEL HAYES Dallas, Polk
DOROTHY DEL BEAN Riverton, Coos	GEORGE HERMAN HESSLER Dayton, Yamhill
BELVA EDNA BEEBE Dallas, Polk	CARL JACKSON HILL Halsey, Linn
FRED GEORGE BEHNKE Portland, Multnomah	REGINALD CHESTER HILLYARD Corvallis, Benton
LOYALTY BERGSVIK Portland, Multnomah	JOHN ABEL HINMAN Everett, Washington State
MABEL MARY BERTSCH Corvallis, Benton	DOROTHY ROSE HUGHES Yelm, Washington State
JOHN WHITNEY BINGHAM* South Pasadena, California	ADDIE ROBERTA HUNTER Corvallis, Benton
PERCY WENDELL BLACKSTONE Corvallis, Benton	GLENN LAWRENCE JACKSON Albany, Linn
WILLIAM JOHN BRAUN Portland, Multnomah	OLIVER CLINTON JESSUP Portland, Multnomah
THOMAS ROY BROWN Applegate, Jackson	ALBERT DOUGLAS JOHNSON Eugene, Lane
RALPH BUONO Portland, Multnomah	JAMES BLAINE KENNEDY Pendleton, Umatilla
JAMES WILLARD CALLAWAY Brownsville, Linn	ROBERTO CLARIS LANE Cascade Locks, Hood River
BENJAMIN WILLIAM CARPENTER Alhambra, California	HOWARD PHILIP LEA Forest Grove, Washington
MARION ALBERT COCHRAN Portland, Multnomah	ARTHUR EMMANUEL LEAF Portland, Multnomah
FLORENCE BELL COLEMAN Wallowa, Wallowa	ELWOOD WATSON LYMAN La Grande, Union
EUNICE ESTHER COURTRIGHT Union, Union	ALURA IRENE MCMINIS McMinnville, Yamhill
ELMER LEROY COYNER Bend, Deschutes	CORA ELIZABETH MASON Ashland, Jackson
KENNETH WALTER CRANDALL Hillsboro, Washington	ROBERT WESLEY MAXWELL Portland, Multnomah
ALLEN WILLIAM CRISSELL Portland, Multnomah	ESTELA MARIE MILLS Ukiah, Umatilla
ROSALIA KELLER DAUS Portland, Multnomah	WILLIAM ODEN MONJAY Corvallis, Benton
CRAIG CHARLES DEDMAN Canby, Clackamas	LOTTIE ELIZABETH MORRIS Yamhill, Yamhill
EDWARD BENJAMIN DREGNIE Barlow, Clackamas	VIRGINIA DOROTHY NESBIT* Portland, Multnomah
TESSIE DURGIN Corvallis, Benton	ROY LAVELLE PATRICK Detroit, Marion
WILMA DYER Mayville, Gilliam	MARGARET ELMORA PEABODY Centralia, Washington State
EDWARD CARLYLE EIKELMAN San Bernardino, California	DAVID CONRAD PETERSON Gresham, Multnomah
ALVIN LOUIS ENGELSON Corvallis, Benton	HAZEL DOLORES PHILIPPI Scio, Linn
JOHN NORVAL FISHER Stayton, Marion	CLEMENT JAMES POWELL Portland, Multnomah
FELIX FREDERICK FORS Portland, Multnomah	MULKH RAJ PURI Portland, Multnomah
JAMES PHIL GNOSE Corvallis, Benton	IRENE MAXINE RAUH Portland, Multnomah
JAMES CHARLES GOLDRAINER Portland, Multnomah	CECIL VERNON REDDEN Corvallis, Benton
KENNETH FRANK GOODALE Corvallis, Benton	HATTIE ESTELA REEDER Salem, Marion
GEORGE DEWEY GRAVES* Beaverton, Washington	HELEN PANSY RICHARDS Rickreall, Polk

\*Degree granted at close of 1924 Summer Session.

HAROLD ARMOND ROWLEY  
Eugene, Lane  
JOSEPH PAUL RUBLE  
Amity, Yamhill  
WALLACE AUBREY SCHEI  
Salem, Marion  
FRANK RAYMOND SHEDD\*  
Shedd, Linn  
ANNIE AMANDA SILVER  
MARVIN SLOAN  
San Bernardino, California  
RUTH RANGHILD SLOTTIE  
Astoria, Clatsop  
NETA MCKILLOP SMITH  
Portland, Multnomah  
WALTER EDWARD SNYDER  
North Bend, Coos  
EUGENIA SQUIRES  
Portland, Multnomah  
RUSSEL MILLARD STEARNS\*  
Enterprise, Wallowa  
ROLLEN STEWART  
Carlton, Yamhill  
WALDO IZATT STODDARD  
La Grande, Union  
GAIL BERNARD STONE  
The Dalles, Wasco  
GILBERT JOHN STRUVE  
Pendleton, Umatilla  
JOHN SULLIVAN  
Portland, Multnomah

MARY MAY SWARM\*  
Norton, Kansas  
ROBERT GEORGE THEIRING  
Marshfield, Coos  
WALTER BERT TOVEY  
Corvallis, Benton  
ARTHUR GERHART TOWE  
Silverton, Marion  
AVERILL TROTTER  
Corvallis, Benton  
SARA SMEDLEY VANCE  
Corvallis, Benton  
CEDRIC ROY VANDERPOOL  
Portland, Multnomah  
HOBART VERMILYE, JR.  
Yakima, Washington State  
MILDRED WALLACE  
Spokane, Washington State  
AMOS WEEKS  
Baker, Baker  
HENRY WESTERMAN WHILLOCK  
Medford, Jackson  
DAVID TAFT WILCOX  
Medford, Jackson  
JOHN ADRIAN HARWOOD WILDMAN  
Portland, Multnomah  
WILLIAM EDWARD WILLIAMS  
Bend, Deschutes  
UNA MADGE WINEGAR  
Monmouth, Polk  
CUYLER CHOY WONG  
Canton, China

## SCHOOL OF ENGINEERING

### *Civil Engineering*

JAMES CLYDE ARCHIBALD  
Albany, Linn  
ARTHUR MARQUIS BUELL  
Salem, Polk  
CARROLL AILING BULLEN  
Portland, Multnomah  
ELLIS WILLIAM DIXON\*  
Corvallis, Benton  
JOY WILLIAM DULL  
Albany, Benton  
FRED INGRAM  
Monroe, Benton  
HENRY FRANKLIN JERAULD  
Sacramento, California  
BLYTHE HENRY OBER  
Portland, Multnomah  
OLIFF NEIL OLSON  
Corvallis, Benton

ARVID FERDINAND PARSON  
Corvallis, Benton  
KENNETH STERLING PERRY  
Klamath Falls, Klamath  
LIONEL HAROLD ROSENTHAL  
Portland, Multnomah  
LOUIS ERNEST RYDELL  
Willamina, Yamhill  
SHEIKH KHURSHAD SAMDANI  
Patiala, India  
DAVID WHITAKER STEARNS  
Corvallis, Benton  
JOHN WILLARD STOUT  
Corvallis, Benton  
FRED HENRY VOSTEEN  
Corvallis, Benton  
CARL FREDERICK WILSON  
Portland, Multnomah

### *Electrical Engineering*

GILBERT WESLEY ABBETT  
Portland, Multnomah  
ELMER FRITHIOF ANDERSON  
Portland, Multnomah  
KIRBY BURDETTE AUSTIN  
Laurel, Montana  
JAMES EDWIN BARTON  
Corvallis, Benton  
ROBERT FRANKLIN BENNETT  
Corvallis, Benton  
WILLIAM RALPH BENNETT  
Corvallis, Benton  
WILLIAM HENRY CARPENTER  
Corvallis, Benton  
IRA BERT CAVE  
Salem, Marion

PITTS ELMORE  
Santa Maria, California  
MARTIN HENRY ENSCHEDÉ  
Forest Grove, Washington  
WILLIAM ALBERT ETCHELLS  
Portland, Multnomah  
MUMTAZ AHMAD FARUQUI  
Lahore, India  
HOWARD DANIEL FOGLE  
Corvallis, Benton  
JACK FRANK GARDNER  
Corvallis, Benton  
ALBERT PORTER GIBSON\*  
Huber, Washington  
OTHEL GUY GOFF  
Corvallis, Benton

\*Degree granted at close of 1924 Summer Session.



WARD HAMMERSLEY  
Alsea, Benton  
DONALD LEE HOLDEN  
Lake Grove, Clackamas  
FRANK HOWARD  
Albany, Linn  
ELMER FERDINAND JOHNSON  
Everett, Washington State  
ARTHUR JACOB JOHNSON  
Corvallis, Benton  
JAMES LORENZO KEARNEY  
The Dalles, Wasco  
ALEXANDER MCFARLANE KELLAS  
Portland, Multnomah  
CALVERT ALBERTA LOVEGREN  
Portland, Multnomah  
HAROLD FELT MERRILL  
Corvallis, Benton  
DALTON WALTER MILLER  
Richland, Baker  
ERNEST LEROY MILLER  
Klamath Falls, Klamath  
FRANKLIN DEWEY PACE\*  
Wells, Benton  
HAROLD EDWIN PARMENTER  
Portland, Multnomah

HAROLD WOODS  
Medford, Jackson

HARRY BENARD PETERSON  
Portland, Multnomah  
JOHN CYRIL POUND  
John Day, Grant  
FORD CONKLIN RITNER  
Corvallis, Benton  
LADNER VALENTINE ROSS  
Portland, Multnomah  
LEONARD STEPHENS SALTER  
Ontario, California  
WILLIAM HOWARD SHRIBER  
Philomath, Benton  
GEORGE WILLIAM SKELLS  
Portland, Multnomah  
THEODORE ROOSEVELT STRAUGHAN  
Pendleton, Umatilla  
JABEZ WILLIAM THURSTON  
Eugene, Lane  
THEODORE FRANKLIN WAKEMAN  
Wedderburn, Curry  
FERRIS DUNTON WHITE  
Newberg, Yamhill  
VALDES WHITE  
Scappoose, Columbia  
VANE ROYAL WILDER  
Phoenix, Jackson

### *Industrial Arts*

VICTOR LELAND BUMP  
Philomath, Benton  
THAXTER NORMAN DANIELS  
Portland, Multnomah  
JOHN RAGNAR ERICKSEN  
Astoria, Clatsop  
JAMES SIDNEY LANE\*  
Cheney, Washington State  
RALPH WALTON PARKER  
Forest Grove, Washington  
MERLE KENNETH SAXE  
Corvallis, Benton

JOSEPH THEODORE SCHLEGEL  
Corvallis, Benton  
FRANK MCNEE STANNARD  
Corvallis, Benton  
MAURICE RALPH STOKESBARY  
Corvallis, Benton  
JOHN WESLEY TUNNELL  
Corvallis, Benton  
WORTH PHILLIPS WATTS\*  
Pendleton, Umatilla  
JAY HAROLD WILLARD  
Corvallis, Benton

### *Mechanical Engineering*

JESS WILLARD BELKNAP  
Polson, Montana  
GEORGE WASHINGTON BROWN  
La Grande, Union  
JOHN WILLIAM CARL  
Garibaldi, Tillamook  
JOHN CORSIGLIA  
St. Helens, Columbia  
THOMAS DAVIDSON  
Ione, Morrow  
EMERY MARCUS DIEFFENBACH  
Salem, Marion  
CHESTER ADRIAN ERICKSON  
Spokane, Washington State  
ROLF WALLENSTEIN FREMMING  
Priest River, Idaho  
JOHN CARYL HESLIN  
Fairview, Multnomah  
JONATHAN RAY HOSTETLER  
Silverton, Marion  
EUGENE ALBERT HUMBLE  
Kelso, Washington State

GEORGE HENRY KELLEWAY  
Corvallis, Benton  
HENRY KYLSTRA  
Portland, Multnomah  
FRED ORVAL MARKHAM  
Freewater, Umatilla  
GERALD PARK  
Oregon City, Clackamas  
HAROLD PARSONS PATTERSON  
Canyon City, Grant  
CHARLES SPAFFORD RANKIN  
Portland, Multnomah  
WALTER GUY ROBBINS  
Philomath, Benton  
RICHARD WESLEY ROBINSON  
Wilderville, Josephine  
GEORGE RICHARD SCHULZ  
Portland, Multnomah  
CARLOS ELMER STEELE  
Portland, Multnomah  
HUGH COULTER VINTON\*  
Portland, Multnomah

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\*Degree granted at close of 1924 Summer Session.

## DEPARTMENT OF CHEMICAL ENGINEERING

ALFRED WILLIAM BEATIE  
Oregon City, Clackamas  
ARTHUR EDSON BIRCH  
Corvallis, Benton  
MARK MANNING CLAYTON  
Corvallis, Benton  
WAYNE LEONARD DENMAN  
Corvallis, Benton  
JAGAN NATH DHAWN  
Kasur, India

RICHARD HENRY FORBES  
Corvallis, Benton  
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Corvallis, Benton  
THOMAS GARDNER HAWLEY, JR.  
Multnomah, Multnomah  
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Roseburg, Douglas  
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Corvallis, Benton

CARL IVAN OLSEN  
Sherwood, Washington

## SCHOOL OF FORESTRY

*Forestry*

FREDERICK AUGUST BACHER  
Corvallis, Benton  
MILTON RAY EDMUNDS  
McMinnville, Yamhill  
PHILIP BARTON GILBERT  
Long Beach, California  
MILLARD PAUL HALE  
Corvallis, Benton  
GEORGE REDSTONE HOPPING  
Vernon, British Columbia  
VERN MCDANIEL  
Kelso, Washington State

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Stayton, Marion  
CLAYTON CORNELL MORSE  
Milwaukie, Clackamas  
TEMPLE MOSS ROBINSON  
Corvallis, Benton  
SAMUEL ROTSCHY  
Vancouver, Washington State  
GEORGE SPAUR  
Roseburg, Douglas  
JOSEPH STREHLE, JR.  
Corvallis, Benton

*Logging Engineering*

ELMER WENDELL BALDERREE  
Dallas, Polk

IRA CRAWFORD GNOSE  
Corvallis, Benton  
KENNETH MCCLAIN MURDOCK  
South Bend, Washington State

## SCHOOL OF HOME ECONOMICS

ESTHER ADAMSON  
Portland, Multnomah  
RUTH ADAMSON  
Portland, Multnomah  
ELEANOR MARIE ANSTAY  
Portland, Multnomah  
KATHARINE BAYLEY  
The Dalles, Wasco  
EDNA MAE BECKETT  
Riverside, California  
CELIA MARIE BERNARDS  
Forest Grove, Washington  
MURIEL MARGARET BLUME  
Albany, Linn  
ORVIS PAULINE BONNEY  
Corvallis, Benton  
CHARLOTTE CHRISTINE BOSTIC  
Sublett, Idaho  
AGNES SARA BRIGHTMAN  
Sitka, Alaska  
NORA EMMA BRODERSEN  
Payette, Idaho  
MARJORIE VIRGINIA BURKHART  
Seattle, Washington State  
ESTELLE JOSEPHINE CALKINS  
Mt. Vernon, Washington State  
STELLA IRENE CARLSON  
Echo, Umatilla  
LUCILE LADNER CLIFTON  
Corvallis, Benton  
EDNA BELLE COBBLEDICK  
Oakland, California

LELA MAUD DENMAN  
Parma, Idaho  
MABLE LEORA DOTSON  
Salem, Marion  
LETA DYER  
Mayville, Gilliam  
ANNA LETA EDINGTON  
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HELEN JANE FLINN  
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FRANCES WETHERBEE FORD  
Corvallis, Benton  
ADA ELIZABETH FOSTER  
Corvallis, Benton  
LUCILE FOSTER  
Corvallis, Benton  
IONE HAZEL FRITZ  
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Talent, Jackson  
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MARIE KATHRINE HUMFELD\*  
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 Jewell, Clatsop  
 VASHTI JOHNSON  
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 ERMA VIVIAN JOHNSON  
 Portland, Multnomah  
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 Portland, Multnomah  
 FLORENCE KLAMP  
 Aumsville, Marion  
 EDYTHE ETHELLE KNIGHT  
 Criterion, Wasco  
 MARIE KUEHN  
 Portland, Multnomah  
 JULIA TOVEY LATIMER  
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 DAGNY CLARA LINDQUIST  
 Silverton, Marion  
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 Vancouver, Washington State  
 BERNICE ELLEN LYMAN  
 Tacoma, Washington State  
 ALICE FRANCES MCCOOL  
 Boise, Idaho  
 ESTELLA MARY MAGGINI  
 Sheridan, Yamhill  
 ELSIE ANN MAGNUSON  
 Everett, Washington State  
 MARIAN LOUISE MILLER  
 Salem, Marion  
 LUCY FAYE MONTGOMERY  
 Portland, Multnomah  
 EDENE LOUISE MOORE  
 Ione, Morrow  
 FLORENCE JANET MORRISON  
 Bellingham, Washington State  
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 Eugene, Lane  
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 Toledo, Lincoln  
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 Hillsboro, Washington  
 BELLE LUCILE PIERCE  
 Vancouver, Washington State  
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 Dayton, Yamhill  
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 DOROTHY SALES  
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 Echo, Umatilla  
 FRANCES MIRIAM SPIKE  
 Echo, Umatilla  
 RUTH CHARLOTTE STEPHENSON  
 Portland, Multnomah  
 DOROTHY IRENE STOVER  
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 Dallas, Polk  
 ETHEL LUELLA TUPPER  
 Forest Grove, Washington  
 DOROTHY KIMBLE VANDYKE  
 Corvallis, Benton  
 LOUISE NELSON VICKERS  
 Corvallis, Benton  
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 Halfway, Baker  
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 Ontario, California  
 LAURA FRANCES WILCOX  
 Ontario, California  
 RUTH IRENE WILSON  
 Montebello, California  
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 Boise, Idaho  
 MABEL ALTONA WOOD  
 Gresham, Multnomah  
 JULIA ORLA WOODBURY  
 Corvallis, Benton  
 LAVELLE YANTIS  
 Corvallis, Benton

#### SCHOOL OF MINES

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 LAWRENCE BERTRUM CHRUDEN\*  
 Portland, Multnomah  
 VICTOR EMANUEL GISSELBERG  
 Portland, Multnomah  
 GEORGE WASHINGTON HELLERICH  
 Corvallis, Benton  
 PHILIP KRIEGER  
 Portland, Multnomah

RICHARD MERYL KRIESEL  
 Salem, Marion  
 DARYL TAYLOR POTTER  
 Corvallis, Benton  
 FRANCIS FITZMAURICE REDFIELD  
 Bend, Deschutes  
 KENNETH GEORGE URFER  
 Portland, Multnomah  
 KENNETH MERTON ZELL  
 Salem, Marion

#### SCHOOL OF PHARMACY

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 Oakland, Douglas  
 WILLIAM NEVUS BONE  
 Corvallis, Benton

JOHN MAXWELL BOWERSOX  
 Monmouth, Polk  
 WILMA EDITH BREWER  
 Corvallis, Benton

\*Degree granted at close of 1924 Summer Session.

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MICHAEL LEE BYRD  
Grants Pass, Josephine  
BROOKS RUSSELL CALDWELL  
Corvallis, Benton  
ORANGE BRANDON CHAMBERLAIN  
Corvallis, Benton  
GEORGE HORACE COSHOW  
Brownsville, Linn  
HENRIETTA ECKSTEIN  
Portland, Multnomah  
GERALD HEWETT  
Independence, Polk  
MARTHA HELEN KIGER  
Corvallis, Benton  
DORIS ELMOR LAKE\*  
Eugene, Lane  
WINNIE LARSEN  
Whitefish, Montana

RICHARD WILVIN LYANS  
Eugene, Lane  
ROLAND FOSTER MARKS  
Halsey, Linn  
HENRY ADOLPH MARTENS\*  
Chinook, Montana  
WILLIAM NED MUNGER  
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JOSEPH DEANE PATTERSON  
Corvallis, Benton  
GORDON OLIVER SHONNESAN\*  
Woodburn, Marion  
ELIZABETH SNYDER  
Corvallis, Benton  
ROBERT ADREN THOMPSON  
Corvallis, Benton  
LEONE TWIDWELL  
Portland, Multnomah  
CLARENCE LYON WOOD  
Corvallis, Benton

### *Pharmaceutical Chemists†*

ALBERT EDWARD BAYNE\*  
Salem, Marion  
LEWIS CLEMENCE BRITT  
Corvallis, Benton  
JOHN BAPTISTE CARR  
Portland, Multnomah  
JACK ROBERT CRAWFORD  
Salem, Marion  
WILLIS FRANCIS DEVANEY  
Albany, Linn  
ROBERT IRAD GRAY  
Woodburn, Marion  
JOHN FILLMORE GREEN  
Monmouth, Polk

GERTRUDE ELISE HANSEN  
Portland, Multnomah  
KENNETH DURALL HIRONS  
Scio, Linn  
MARION EDWARD MCKEE  
Wasco, Sherman  
JAMES WAYNE MACK  
Hubbard, Marion  
CHARLES NICHOLAS MILLER  
Lemon Grove, California  
KENNETH CLAIR PERRY  
Salem, Marion  
VICTOR MYRON TRASK  
Corvallis, Benton

### *Graduates in Pharmacy‡*

HAROLD MAYNARD FISS  
Salem, Marion

GORDON OLIVER SHONNESAN\*  
Woodburn, Marion

### SCHOOL OF VOCATIONAL EDUCATION

CECILE BELLE CASE\*  
Waterville, Washington State  
DAVID CLARK  
Veneta, Lane  
MAPLE LUCILE COLE  
Canby, Clackamas  
ARNOLD COLLIER  
Eugene, Lane  
BARBARA JEANNE CONROY  
Anaconda, Montana

LOIS EDWENA FENDALL  
Newberg, Yamhill  
MICHAEL REID HANGER\*  
Portland, Multnomah  
MARGARET MEHEGAN HARDING  
Lewiston, Idaho  
ADA LOUISA HAWLEY  
Woodburn, Marion  
HAZEL HOFFMAN  
Bacona, Washington  
RUBY MOENCH HUDSON  
Albany, Linn  
WILLIAM HENRY HUDSON  
Albany, Linn  
ETHEL FRANCES JAHN  
Albany, Linn

CATHERINE ELLEN BARHYTE\*  
Salem, Marion  
MAUDE LILIAH BECKETT  
Portland, Multnomah  
LELIA MAE BEGGS  
Corvallis, Benton  
EMMA JOHANNA BERG  
Canby, Clackamas  
KATHLEEN AUBREY BITNEY  
Corvallis, Benton

IVERN LUCILE KELLER  
Ashland, Jackson  
JAMES SIDNEY LANE\*  
Cheney, Washington State  
MARGARET OCTAVIA LUCIUS  
Portland, Multnomah  
IONE CECELIA LUEHRs\*  
Ontario, Malheur  
RUTH LYON  
Pasadena, California  
JOSEPHINE MCCOURT  
Yoncalla, Douglas  
RUSSELL ALFRED MCCULLY\*  
Melba, Idaho  
VIDA MAE MCKERN\*  
Yakima, Washington State

\*Degree granted at close of 1924 Summer Session.

†This degree granted on completion of three-year curriculum.

‡This degree granted on completion of two-year curriculum.



MARGARET McLEOD  
The Dalles, Wasco  
MABEL ELIZABETH MARCUS  
Salem, Marion  
RILEY MOY MILLIGAN\*  
Rialto, California  
MARY LOUISE NEWPORT  
Lebanon, Linn  
FRANCES ESTELLE NORDBERG  
Portland, Multnomah  
EDWARD WARNER OLIVER\*  
Corvallis, Benton  
ELIZABETH OWENS  
Raymond, Washington State  
EDITH CATHERINE PLAVAN  
Corvallis, Benton  
FRIEDA BERTHA ANNE PORTMANN  
Tacoma, Washington State  
LENORE ELSIE PRESTON\*  
Dallas, Polk  
FRANCES DANTA ROBBINS  
Salem, Marion  
ERNEST LEROY ROOT  
Myrtle Point, Coos

DENABELLE SAWYERS  
Elkton, Douglas  
EVA MARIE SCHULTZ  
Portland, Multnomah  
MARTHA ALMEDA SMITH\*  
Portland, Multnomah  
FRANK McNEE STANNARD  
Corvallis, Benton  
JUANITA KATHARINE TARR  
Seattle, Washington State  
ELEANOR THOMAS  
Portland, Multnomah  
PAULINE LUCILE THOMPSON  
Prosser, Washington State  
LOTTIE EVELYN UHLMAN  
Scappoose, Columbia  
HERBERT TOWNSEND VANCE\*  
Corvallis, Benton  
MARY RUSSELL VARNEY  
Powers, Coos  
NADYNE WADDLE  
Portland, Multnomah  
ALICE GERTRUDE WALKER  
Corvallis, Benton

AUSTIN WINN  
Corvallis, Benton

#### SCHOOL OF MUSIC†

EDNA MAY MERRITT  
Merrill, Klamath

#### MASTERS OF SCIENCE

- ARNOLD STEWART BURRIER (Farm Management)  
Corvallis, Benton.  
B.S., Agriculture, 1924, University of Missouri.  
Thesis: Some Factors in the Organization of the Successful Prune Farm in Oregon.
- CHARLES HARTMANN, JR., (Soils)  
Hollister, California.  
B.S., Agriculture, 1921, Oregon Agricultural College.  
Thesis: The Crop Producing Power of Limited Quantities of Essential Plant Nutrient.
- HARRY MAXWELL KING (Animal Husbandry)  
Vancouver, British Columbia.  
B.S., Agriculture, 1913, Ontario Agricultural College, Canada.  
Thesis: The Livestock Producing Resources of British Columbia, Washington, and Oregon.
- NORMAN JAMES LAUGHLIN (Agricultural Education).  
Corvallis, Benton.  
B.S., Agriculture, 1924, Oregon Agricultural College.  
Thesis: The Organization and Supervision of Agriculture in the High Schools of Oregon.
- ARTHUR DAVID MOINAT (Horticulture)  
Ft. Collins, Colorado.  
B.S., Agriculture, 1924, Colorado Agricultural College.  
Thesis: A Study of the Germination and Growth of Pollen in Artificial Cultures.
- JOSEPH WEBSTER NEWELL (Pomology)  
Portland, Multnomah.  
B.S., Agriculture, 1916, Oregon Agricultural College.  
Thesis: A Statistical Study of the Bearing Shoots of the Filbert (*Corylus Avellana*).
- HOWARD CECIL STEARNS (Entomology)  
Portland, Multnomah.  
B.S., Agriculture, 1924, Oregon Agricultural College.  
Thesis: The European Earwig—Its Life History, Habits, and Natural Enemies.
- VILAS DEVALD YOUNG (Soils)  
Galesville, Wisconsin.  
B.S., Agriculture, 1923, University of Wisconsin.  
Thesis: Improvement in Percolation of Water Through Soils Having a High Clay Content and Restricted Drainage.

\*Degree granted at close of 1924 Summer Session.

†Diploma granted on completion of four-year curriculum.

## DEGREES CONFERRED JUNE 7, 1926

## BACHELORS OF SCIENCE

## SCHOOL OF AGRICULTURE

*Agricultural Education*

\*FRANK EMIL ROSSMAN  
San Francisco, California

*Animal Husbandry*

GLENN RICHARD GREENWOOD  
Corvallis, Benton  
ROBERT LEWIS IRVING  
Wilbur, Douglas  
CARLTON EDWARD JOUGHIN  
Corvallis, Benton  
AMANDO MAGABO MARTINEZ  
Corvallis, Benton

FRANK LINCOLN MERRILL  
Corvallis, Benton  
ELMER EDWARD ROSENKILDE  
Multnomah, Multnomah  
ROBERT OLNEY STONE  
Corvallis, Benton  
CHARLES LAWSON TORBITT  
Longview, Washington State

*Botany and Plant Pathology*

LAVERNE STANARD SEVERANCE  
Portland, Multnomah

*Plant Pathology*

THOMAS DWIGHT MALLERY  
Corvallis, Benton

*Dairy Husbandry*

DALE EMERY BORROR  
Corvallis, Benton  
FREEMAN HOWARD DULL  
Albany, Linn  
JAMES GORDON GIBSON  
Gresham, Multnomah  
GEORGE NATHAN GRAY  
Ashland, Jackson  
JOHN READ GREENWOOD, JR.  
Forest Grove, Washington  
CECIL LAWRENCE GRIGGS  
Eugene, Lane  
OSCAR NATHANIEL HAGG  
Reedville, Washington  
ELLIOT EUGENE HORN  
Pasadena, California

JAMES WILLIAM JARVIS  
Port Townsend, Washington State  
WALLACE COLE MASS  
Oregon City, Clackamas  
VISHRAM HARI PATIL  
Chahardi, India  
ALEXANDER STEPHEN ROBERTSON  
Corvallis, Benton  
ALBERT ELWIN SKIDMORE  
Corvallis, Benton  
CAREY KERVYN TALLY  
North Powder, Union  
WILLARD HERMAN VAN DYKE  
Corvallis, Benton  
JAMES KIICHI YAMAMOTO  
Corvallis, Benton

*Entomology*

EARL GEORGE DAVIS  
Tacoma, Washington State

GUY ROBERT MCGINNIS  
Corvallis, Benton  
CONVERSE HIATT YORK  
Corvallis, Benton

*Farm Crops*

ROY EVERT ENGBRETSON  
Astoria, Clatsop

VIOLET MABEL HASKIN  
Lebanon, Linn  
WILBUR WRAY LAWRENCE  
Corvallis, Benton

*Farm Management*

ALBERT WATTS MOORE  
Aloha, Washington

OSCAR RICKTER  
Rio Dell, California.

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*General Agriculture*

FRED JOSEPH BAIRD  
Corvallis, Benton  
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Newark, California  
MELVIN JULIUS BRUGGER  
Gresham, Multnomah  
LEWIS EDWARD DUNCAN  
Albany, Linn  
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Corvallis, Benton

ATANASIO CASINGAL MATABAN  
Corvallis, Benton  
ROSCOE BENJAMIN PAINE  
Pomona, California  
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Kolasin, Montenegro  
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Corvallis, Benton  
\*ARTHUR ROSS  
Salem, Marion  
ALEXANDER VON HERZEN  
Corvallis, Benton  
ARCHIE MEADOR WELLS  
Roseburg, Douglas

ALFRED JAMES WHEALDON  
Salem, Marion

*Horticulture—Horticultural Products*

RANENDRA KRISHNA DUTT  
Corvallis, Benton

JAMES SIM SHARP  
Corvallis, Benton

*Horticulture—Landscape Gardening*

NINA MARY BELT  
Newport, Lincoln

CHARLES DOUGLAS ROBINSON BLACK  
Upland, California

ALBERT STEWART HART  
Corvallis, Benton

*Horticulture—Pomology*

WILLIS CLAIR BOGLI  
Culver, Jefferson  
KENNETH ALTON BURSSELL  
Dallas, Polk  
HURSEY ALFRED DAKIN  
Freewater, Umatilla  
MINNIE GUSTAVA ENGEN  
Patterson, California  
DOROTHY PIERCY HILL  
Talent, Jackson

RAYMOND LOUIS HOSFORD  
Menomonie, Wisconsin  
RAM CHANDAR MALHOTRA  
Jammu, India  
RAYMOND HENRY MARSH  
Fullerton, California  
\*ARTHUR PETER MESPelt  
San Bernardino, California  
JAMES CECIL MOORE  
Corvallis, Benton

MILES LAURENCE TROWBRIDGE  
Portland, Multnomah

*Marketing of Agricultural Products*

KENNETH DUNGAN  
Santa Ana, California  
PIERRE LA VERNE FAURIE  
Molalla, Clackamas  
GEORGE HERRICK JENKINS  
Corvallis, Benton  
VERNON PRESCOTT JENKINS  
Glendale, California

ARTHUR EVERETT MILLER  
Seattle, Washington State  
GORDON ALISTER PRATT  
Portland, Multnomah  
BENJAMIN HENRY PUBOLS  
Hillsboro, Washington  
HAROLD FORBES RIDINGS  
Molalla, Clackamas

ROY SWANSON  
Tacoma, Washington State

*Poultry Husbandry*

WILLIAM GLEN MCKINLEY  
Clatskanie, Columbia

*Soils*

ARTHUR OTTO ALBEN  
Vancouver, Washington State  
LINDLEY FOWLER BOTHWELL  
Los Angeles, California

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Corvallis, Benton  
HERMAN MCCORMICK  
Corvallis, Benton

*SCHOOL OF COMMERCE*

SPENCER WHEELER ALEXANDER  
Corvallis, Benton  
MARJORIE INA ANDERSON  
Corvallis, Benton  
PHILIP MAPES BAIRD  
Corvallis, Benton

OLIVER ALFRED BAISCH  
Corvallis, Benton  
LORIS ROY BAKER  
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RAY BALDWIN, JR.  
Portland, Multnomah

\*Degree granted at close of 1925 Summer Session.

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Drain, Douglas  
HOWARD FREDERICK BLAKE  
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LOYDE SAMUEL BLAKLEY  
Bend, Deschutes  
HARRY BOWER  
Eugene, Lane  
CLAUDE STANLEY BOWMAN  
Corvallis, Benton  
CARLISLE BAINBRIDGE BOYD  
Corvallis, Benton  
MARIE LUCY BREZZOLAIRE  
Portland, Multnomah  
LORIN JAMES BRITT  
Corvallis, Benton  
GLADYS LEE BUCKNUM  
Eugene, Lane  
SAMUEL LYLE BURNAUGH  
Corvallis, Benton  
\*CHARLES CLAUDIUS CHRISTIANSEN  
Ontario, Malheur  
\*LOTUS CONSER  
Albany, Linn  
THEODORE THOMAS COWGILL  
Jordan Valley, Malheur  
WILLARD MAXON CRAIG  
Corvallis, Benton  
INEZ LEOLA DARLING  
Corvallis, Benton  
BERNARD CLINTON DAVIS  
Drain, Douglas  
ROBERT DAVIS  
Corvallis, Benton  
CLIFFORD MARSHALL DAWES  
Portland, Multnomah  
ETHEL COWGILL DENTEL  
Jordan Valley, Malheur  
OLIVE MARIE DIETLEIN  
Portland, Multnomah  
BERNAL EUGENE DOBELL  
Corvallis, Benton  
ANDREW HOSTMARK EKERN  
Corvallis, Benton  
EARL MERIT FARRA  
Paisley, Lake  
CLARKE HUBERT FISHER  
Portland, Multnomah  
\*RICHARD OTIS GARBER  
Freewater, Umatilla  
WILLIAM JOHN GEIBERGER  
Tualatin, Washington  
EVELYNE BEATRIX GENOE  
Portland, Multnomah  
\*PAUL EDWARD GINDER  
Pasadena, California  
MARGARET MARY GOULD  
Hood River, Hood River  
IDA JOSEPHINE GRANBERG  
Portland, Multnomah  
ERNEST JEROME HAEVERNICK  
Silverton, Marion  
FREDERICK DIENSTADT HALL, Jr.  
Pendleton, Umatilla  
CARRIE BEATRICE HALSELL  
Portland, Multnomah  
SHIGEICHI HASEGAWA  
Portland, Multnomah  
ELIZABETH HEATH  
Corvallis, Benton  
EDNA LENORE HOBART  
Corvallis, Benton  
EMILY HOUT  
Corvallis, Benton

PAUL IRVINE  
Portland, Multnomah  
HARALD OSBERG JOHNSON  
Portland, Multnomah  
ROLLAND INGRAHAM JONES  
McMinnville, Yamhill  
SEBORIS ODESSA JORDAN  
Astoria, Clatsop  
ELIZABETH BARKER KELLY  
Hood River, Hood River  
STANLEY K KNOX  
Olympia, Washington State  
JOHN HERMAN KOLKANA  
Portland, Multnomah  
LOUIS ERNEST KUEHN, JR.  
Portland, Multnomah  
LOUIS LABARE  
St. Helens, Columbia  
CLARIBEL LAMONT  
Portland, Multnomah  
LAWRENCE MARTIN LANDRITH  
Eugene, Lane  
STANLEY BLUMAUER LANG  
Portland, Multnomah  
PAMELER ALBERTA LANGTON  
Newberg, Yamhill  
LATHROP KING LEISHMAN  
Corvallis, Benton  
DAVID LIVINGSTON LILLY  
Corvallis, Benton  
WILLIS DAVID LINK  
Eugene, Lane  
VIOLET ELVIRA LOYDGRIN  
Portland, Multnomah  
ALICE ERMINA LUTZ  
Newberg, Yamhill  
ARTHUR GEORGE MAKI  
Grays River, Washington State  
GERTRUDE LOUISE MEINIG  
Sandy, Clackamas  
LORA OLIVE MITCHELL  
McMinnville, Yamhill  
CHESTER CLARE MORGAN  
Roseburg, Douglas  
ALICE EMILY MORRIS  
Yamhill, Yamhill  
REUEL LE REINE MORTON  
Corvallis, Benton  
MAURICE MURRAY  
Corvallis, Benton  
LEONA MYERS  
Condon, Gilliam  
WILLIAMSON CLAUDE MYERS  
Condon, Gilliam  
MAURICE JAMES NEWLAND  
Roseburg, Douglas  
MILES DELBERT NEWMAN  
Corvallis, Benton  
EASTER LILY NOBLE  
Canby, Clackamas  
CHESTER KINGSTON NOONAN  
Astoria, Clatsop  
FRED WESLEY PARKER  
Pendleton, Umatilla  
MILDRED PIERCE  
Portland, Multnomah  
\*JAMES ALBERT PLUNKETT  
Corvallis, Benton  
LEWIS CLINTON POOLER  
Corvallis, Benton  
MARTIN RAMSBY  
Klamath Falls, Klamath  
FREDERICK CLARKE REED  
Portland, Multnomah  
JEANNETTE RICE  
Roseburg, Douglas

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EDGAR RICKARD  
Junction City, Benton  
DOROTHY WILMA RIGGS  
Portland, Multnomah  
LUCIAN THOMAS ROBINSON  
Portland, Multnomah  
ESTELL HORTON RORICK  
The Dalles, Wasco  
EUNICE ALFREDA RYDMAN  
Portland, Multnomah  
RALPH HENRY SCHLEGEL  
Portland, Multnomah  
HOWARD PARKER SEDGWICK  
Creswell, Lane  
JENNIE BELLE SHERWOOD  
Portland, Multnomah  
RAY ARTHUR SLAVENS  
Portland, Multnomah  
HELEN JENNIE SMITH  
Portland, Multnomah  
HUGH MORRISON SMITH  
Portland, Multnomah  
BLAIR LAWRENCE STEWART  
Corvallis, Benton  
ARTHUR GEORGE TAAFFE  
Portland, Multnomah

GENEVIEVE ROBERTA THOMAS  
Portland, Multnomah  
WARREN VERNON TOTTEN  
Corvallis, Benton  
\*GALEN BARTHALOW TUCKER  
Forest Grove, Washington  
\*DOROTHY GRACE TURNER  
Ontario, Malheur  
MAXIME HARVEY TURNER  
Pasadena, California  
RALPH THOMAS URE  
Portland, Multnomah  
IRMA VIOLA VAN HOLLEBEKE  
Corvallis, Benton  
GARETT EDWARD VAN NUYS  
Portland, Multnomah  
PAUL MORAND WALKER  
Portland, Multnomah  
CORNELIUS OSMUND WATNEY  
Corvallis, Benton  
NELLIE ELIZABETH WESCH  
Tualatin, Washington  
HOWARD WALDO WICKERSHAM  
Alhambra, California  
CLINTON WOODRUFF  
Brea, California

JOHN OWEN YOUNG  
Madras, Jefferson

## SCHOOL OF ENGINEERING

### *Civil Engineering*

CLYDE BEAM  
Nyssa, Malheur  
\*ELMER LYNN CAVIN  
Corvallis, Benton  
RICHARD KENNETH DURANT  
McMinnville, Yamhill  
FREDERICK WILLIAM ERVAST  
Corvallis, Benton  
RUSSELL LOWELL HARRIS  
Central Point, Jackson  
EMORY EARL JOHNSTON  
Athena, Umatilla  
EDWARD WILLIAM LAIRD  
North Bend, Coos

CHUNG MEI LI  
Chih-Hsien, China  
MORRIS ROBERT LITT  
Portland, Multnomah  
RAY FRED NEWTON  
Portland, Multnomah  
CHARLES HENNIGER REAGAN  
Corvallis, Benton  
GEORGE BEARBY SEDGWICK  
Creswell, Lane  
\*EUGENE SQUIRES  
Portland, Multnomah  
ROBERT TALLMADGE STANLEY  
Portland, Multnomah

ADRIAN HARRY WILLIAMS  
Portland, Multnomah

### *Electrical Engineering*

LESTER WILLIAM BAILEY  
Gladstone, Clackamas  
DESKIN ORVAL BERGEY  
Whitefish, Montana  
LIONEL JOHN BISHOP  
Corvallis, Benton  
CARL HENRY BJORKQUIST  
Marshfield, Coos  
WILBUR WARD BONAR  
Albany, Linn  
WILLIAM DENNISTON CRAWFORD BRIDGES  
Corvallis, Benton  
\*GLENN MILTON BRITT  
Corvallis, Benton  
EARL CASTOR  
Molalla, Clackamas  
\*CHARLES McDONALD CHEELD  
Vancouver, Washington State  
IRVING FREDERICK DAY  
Portland, Multnomah  
MELVIN DEAN DORSEY  
Alsea, Benton

FRED DYSLE  
Portland, Washington  
ALVA WOODSON FLIPPIN  
Rainier, Columbia  
\*EDWARD GARDINER  
Oregon City, Clackamas  
CLAIRE VERNON HENKLE  
John Day, Grant  
VICTOR PETER HESSLER  
Corvallis, Benton  
OWEN WILSON HURD  
Corvallis, Benton  
LLOYD MARTIN JANZ  
Portland, Multnomah  
EARL EDWARD KEARNS  
Pendleton, Umatilla  
WILLIAM HENRY KURTZ  
Hillsboro, Washington  
CHARLES WILLARD LEIHY  
Portland, Multnomah  
LEO JOHN LEONNIG  
Haines, Baker

\*Degree granted at close of 1925 Summer Session.

ALBERT FRANKLIN LEWIS  
Portland, Multnomah  
HOBART CLAUDE McDANIEL  
North Bend, Coos  
CHARLES ROBERT MCLEAN  
Corvallis, Benton  
FRED MAGGINI  
Sheridan, Yamhill  
URAM HENRY MESSENGER  
Boardman, Morrow  
TRUMOND PETERSON  
Portland, Multnomah  
BLAIR EVERETT PLOWMAN  
Corvallis, Benton  
DONALD JOHN JAMES PRUDHOMME  
Portland, Multnomah  
HARRY ERNEST RHOADS  
Corvallis, Benton

GEORGE BENJAMIN RICE  
Myrtle Creek, Douglas  
REGINALD RUSSELL  
Gladstone, Clackamas  
RANALD MARLIN SEAVER  
Eugene, Lane  
FRANCIS ROBERT SLATER  
Portland, Multnomah  
ROBERT NEWTON SLINGER  
Portland, Multnomah  
VASILY JACOB SOLODOFF  
Orenburg, Russia  
VIRGIL LEROY SURFUS  
Portland, Multnomah  
NOAH HARTMAN TRUAX  
Klamath Falls, Klamath  
WILLIAM THEODORE VALE  
Klamath Falls, Klamath

### *Industrial Arts*

KORLE FAYE COULSON  
Corvallis, Benton  
ORVILLE ALEXANDER CUMMING  
Salem, Marion  
\*ARNOLD HENRY DREWS  
Portland, Multnomah  
LEROY LAWRENCE ERDMANN  
Junction City, Lane  
JAMES MARION GIBSON  
Corvallis, Benton  
ROBY DELOSS GOFF  
Oakland, Douglas

JALMER MATTHIAS KOSKI  
Corvallis, Benton  
UEL BARTON MARR  
Dundee, Yamhill  
\*GEORGE EDWARD MYERS  
Corvallis, Benton  
HARRY GEORGE NELSON  
Firth, Idaho  
TOM GRIFFIS RATHBONE  
Tacoma, Washington State  
WALTER HIRSCHHELL SCHERER  
Corvallis, Benton

\*HERBERT EARL WELCH  
Salem, Marion

### *Mechanical Engineering*

JULIAN DE FOREST BURROUGHS  
Salem, Marion  
FRED FRANKLIN BURYA  
Woodburn, Marion  
BRUCE CASSELL  
Portland, Multnomah  
ARLIE EDWARD CAUDLE  
Portland, Multnomah  
PAUL NOBLE DEAN  
Corvallis, Benton  
FRED JULIUS GIROUX  
Corvallis, Benton  
BERNARD MORSE GUTHRIE  
Corvallis, Benton  
JAMES LEEDOM HEILIG  
Portland, Multnomah  
\*ERNEST DANIEL HEILMAN  
Groton, Connecticut  
\*ELVIN ALBERT HOY  
Portland, Multnomah  
HERBERT NEWTON JOHNSON  
Portland, Multnomah  
RUDOLPH ALFRED JOHNSON  
Marshfield, Coos

RALPH NICHOLAS LUNDE  
Corvallis, Benton  
LEONARD CALVIN NEWMAN  
Portland, Multnomah  
RAY CHRISTOPHER REHBERG  
Walla Walla, Washington State  
IVAN FARRINGTON ROBERTS  
The Dalles, Wasco  
EDWIN EMERSON ROBINSON  
Wilderville, Josephine  
CARL BURSE TETHEROW  
Monmouth, Polk  
JOHN GUSTAVE THEWS  
Corvallis, Benton  
SAMUEL WALKER WADDLE  
Portland, Multnomah  
\*ARTHUR PAUL WENDLAND  
Salem, Marion  
JOHN EDGAR WHITAKER  
Roseburg, Douglas  
SILAS EDWARD WIGHTMAN, Jr.  
Portland, Multnomah  
RICHARD ALFRED YOUNG  
Madras, Jefferson

### DEPARTMENT OF CHEMICAL ENGINEERING

FREDERICK LESTER ANDRUS  
Portland, Multnomah  
FRED FRANK DIWOKY  
Council Bluffs, Iowa  
FELIX VALENCERINA ESPINO  
Salasa, Philippines  
PHILIP HENRY FAUCETT  
Clatskanie, Columbia  
STANLEY GRIFFITH FORD  
Portland, Multnomah

HARRY GORESLINE  
Corvallis, Benton  
MILTON HARRIS  
Portland, Multnomah  
SIDNEY IRVING REICHAUT  
Corvallis, Benton  
FREDERICK ALVIN ROHRMAN  
Pendleton, Umatilla  
GEORGE EMILE SCHMIDT  
Portland, Multnomah

\*Degree granted at close of 1925 Summer Session.

ERCELL CALEM SNEED  
Halsey, Linn

HORACE AVERY STEARNS  
Portland, Multnomah

WING WONG  
San Francisco, California

## SCHOOL OF FORESTRY

### *Logging Engineering*

HOMER GORDON BURSSELL  
Dallas, Polk  
ROY CLIFFORD GIBSON  
Portland, Multnomah  
CHARLES WESLEY HALL  
McMinnville, Yamhill

TREVOR LEWIS  
Corvallis, Benton  
CHARLES RAYMOND ROSENKRANS  
Portland, Multnomah  
†JAMES DELMAR SHAVER  
Portland, Multnomah

### *Technical Forestry*

PAUL CHESTER CASE  
Corvallis, Benton  
ERNEST EDWARD FISCHER  
Milwaukie, Clackamas  
LEROY ALVA HAWKINS  
Toledo, Lincoln  
ALBERT FREDERICK JANOWSKI  
Corvallis, Benton

SIDNEY CARROLL JONES  
Chehalis, Washington State  
KELLY BEECHER MCGUIRE  
Corvallis, Benton  
HERSCHEL CHRISTIAN OBYE  
Yamhill, Yamhill  
KARL PREIFFER  
Port Townsend, Washington State

LOUIS RAYMOND ZOBEL  
Council Bluffs, Iowa

## SCHOOL OF HOME ECONOMICS

CLARA ELIZABETH ADAMS  
Corvallis, Benton  
CLARA ISABELLE ALDRUP  
Corvallis, Benton  
MARGARET RUTH BAKER  
Clackamas, Clackamas  
ESTHER MAY BENSON  
Portland, Multnomah  
FRANCES ELIZABETH BRADFORD  
Monroe, Benton  
FLORENCE ARCHIE BRYANT  
Forest Grove, Washington  
LOIS BUNNELLE  
Corvallis, Benton  
JENNIE IDELLA CLARK  
Portland, Multnomah  
MILDRED CORNUTT  
Portland, Multnomah  
VIVIAN VA LETHA CRAMER  
Silverton, Marion  
RUTH FRANCES CRAWFORD  
Corvallis, Benton  
ANNA ELIZA DAVIS  
Montague, California  
LOIS MAULINE DENNY  
Freewater, Umatilla  
HELEN LOUISE EDWARDS  
Oakland, California  
GEORGIA MARGUERITE ENGLISH  
Junction City, Lane  
REVA MAY EVERHART  
Molalla, Clackamas  
RUTH LOUISE GILL  
Corvallis, Benton  
MARY JEANETTE GITTINGS  
Camas, Washington State  
MARY LUCILLE GORESLINE  
Corvallis, Benton  
HELEN ERMINE GRIFFEE  
Corvallis, Benton  
BEATRICE EVA GUNTER  
Grants Pass, Josephine

DORMA ISABELLE HAINES  
Canby, Clackamas  
GENEVA HALE  
Portland, Multnomah  
EDNA MAE HAMILTON  
Delano, California  
GLADYS MARIE HARTLEY  
Medford, Jackson  
\*DOROTHY HILL  
Corvallis, Benton  
LUCILE FRANCES HOLLINSHEAD  
Portland, Multnomah  
\*RACHEL ANN HOLLOWAY  
Portland, Multnomah  
WINIFRED LOIS HORN  
Corvallis, Benton  
EILEEN LAURA HUXTABLE  
Corvallis, Benton  
LAVELLE IRENE IRVINE  
McMinnville, Yamhill  
JESSIE ANNABELLE ISBISTER  
St. Helens, Columbia  
ANNA MARGUERITE JENSEN  
Junction City, Lane  
GERTRUDE ANGELINE JOHNSON  
Corvallis, Benton  
MABEL VIVIAN JOHNSON  
Roseburg, Douglas  
MARGARET LILLIAN JOHNSON  
Medford, Jackson  
ROSE MARY KENNEDY  
Portland, Multnomah  
MONA JEANE LA DOW  
Corvallis, Benton  
\*RUTH LAIRD  
Corvallis, Benton  
LUCILE LELAND  
Portland, Multnomah  
HELEN MARGARET LEONARD  
Portland, Multnomah  
MARY ELIZABETH LITTLE  
Corvallis, Benton

†Deceased.

\*Degree granted at close of 1925 Summer Session.

CLARA NEOMA LOVE  
Portland, Multnomah  
JEAN MARGARET McCLEW  
Eugene, Lane  
DOROTHY ELEANOR MCGAUHEY  
Corvallis, Benton  
MARY ETELLE MCGOOKIN  
Corvallis, Benton  
RUBY ROYCE MCPHEETERS  
Corvallis, Benton  
DOROTHY MAE METSKER  
St. Helens, Columbia  
CLARA MILLER  
Eugene, Lane  
ELLA FRANCES MILLER  
La Grande, Union  
AGNES ISABEL MORRISON  
Bellingham, Washington State  
ANNE ALICE MURRAY  
Corvallis, Benton  
DOROTHY LOUISE PETERSON  
Corvallis, Benton  
TRESSA MARY PHILLIPS  
McMinnville, Yamhill

HELEN JO ROBB  
Portland, Multnomah  
RILDIE BLANCHE ROBERTS  
Eagle Creek, Clackamas  
MARTHA LILIE ROSEN  
Monroe, Washington State  
GLADYS CLEM SANDRY  
Rogue River, Jackson  
\*LOUISE ALBERTA SCHNEIDER  
Corvallis, Benton  
IRMA SCRITSMIER  
Portland, Multnomah  
LOIS SCROGGIN  
Corvallis, Benton  
RUTH SHERWIN  
Salem, Marion  
MARJORIE MAY STONE  
Denton, Montana  
FAY JEAN THOMPSON  
Riverside, California  
ORPHA AUDREY TITUS  
McMinnville, Yamhill  
MARIAN LEROY WALTER  
Corvallis, Benton

MILDRED WHITE  
Portland, Multnomah

### SCHOOL OF MINES

LLOYD RAY BARNWELL  
La Grande, Union  
ARCHIBALD RALPH DAVIS, JR.  
Corvallis, Benton

DONALD LESLIE MASSON  
Monroe, Benton  
JOSHUA LATHROP PIERSON  
Hood River, Hood River

CHARLES REISH  
Orange, California

### SCHOOL OF PHARMACY

LEWIS CLEMENCE BRITT  
Corvallis, Benton  
\*JOHN BAPTISTE CARR  
Portland, Multnomah  
EDWARD NORTH DUNN  
Corvallis, Benton  
WILLIAM HERBERT  
Corvallis, Benton  
JOHN HARDY MALONE  
Crabtree, Linn

HARRY DUNLAP MORRIS  
Corvallis, Benton  
MILDRED ELLEN RICKARD  
Corvallis, Benton  
ELDON ALFRED SNELL  
Albany, Linn  
CHARLES SUMNER TAYLOR  
Portland, Multnomah  
\*VICTOR MYRON TRASK  
Corvallis, Benton

### *Pharmaceutical Chemists*

\*JAMES HENRY BAKER  
Eugene, Lane  
CLIFFORD EUGENE COON  
Astoria, Clatsop  
WILLIAM LUTHER CORCORAN  
Halsey, Linn  
GEORGE HORACE COSHOW  
Brownsville, Linn  
WILLIS KENNETH CROSS  
Halsey, Linn  
RHESA WILLARD DUNCAN  
Lakeview, Lake  
FRANK JAMES GOLDEN  
Ontario, Malheur  
SYLVIA GENEVA GOOCH  
Philomath, Benton

RAYMOND LLOYD GUERBER  
Beaverton, Washington  
ALFERD HENRY ILLGE  
Portland, Multnomah  
ANDREW IRWIN, JR.  
Baker, Baker  
\*MARTHA HELEN KIGER  
Corvallis, Benton  
EARL MOOTRY  
Willamette, Clackamas  
CLIFFORD WALLACE PIKE  
Corvallis, Benton  
LELAND ROBERT ROHNER  
Baker, Baker  
WILLIAM WALLIS VERMILYE  
Corvallis, Benton

\*Degree granted at close of 1925 Summer Session.



## SCHOOL OF VOCATIONAL EDUCATION

KATHERINE ALLEN Albany, Linn	LOIS JUANITA MCCOOL Corvallis, Benton
HUGH BARKLEY ANTRIM Corvallis, Benton	HAZEL MCKERN Milton, Umatilla
*MARY ATKINSON Corvallis, Benton	STELLA IRENE MACKLIN Astoria, Clatsop
FRED JOSEPH BAIRD Corvallis, Benton	MAURICIO LINO MATEO Guimba, Philippines
PAULINE BOND Portland, Multnomah	EARL DUDLEY MATHIS Broughton, Illinois
*GEORGE CLIVE BOOTH Grants Pass, Josephine	GLEN ARTHUR METZLER Corvallis, Benton
RUTH LEAH BROMBERG Portland, Multnomah	FRANCES ANN MILLS Portland, Multnomah
*FAITH RUTHERFORD BURK Portland, Multnomah	ALICE GWENDOLYN MORRIS Corvallis, Benton
DOROTHY LOUISE BUSH Portland, Multnomah	HELEN AGNES MOSER Corvallis, Benton
ALFRED BERNARD CARTER Portland, Multnomah	VINA ELEANOR MUELLER Vale, Malheur
ROLAND EUGENE DIMICK Newport, Lincoln	MARTHA HOWARD MULLER Drewsey, Harney
BESS EMILY ERWIN Astoria, Clatsop	RUTH JEAN MURRAY Corvallis, Benton
THELMA MINARD GANNAWAY Medford, Jackson	HERWIG REINHART NETTER Aurora, Clackamas
FRANC POUND GILBERT Portland, Multnomah	HELMI LUCINA PENTTILA Astoria, Clatsop
RUBY GODARD Corvallis, Benton	WILMA MAY PLAVAN Santa Ana, California
SHERMAN LESLIE GODARD Corvallis, Benton	ERNEST ROBERT QUINN Toledo, Lincoln
FERNE GRIBBIN Weiser, Idaho	TOM GRIFFIS RATHBONE Tacoma, Washington State
MYRA MARIE GUNTER Grants Pass, Josephine	DOROTHY DARTMOUTH REDENBAUGH Corvallis, Benton
GLADYS ELOISE HARE Corvallis, Benton	ELINOR RIDENOUR Corvallis, Benton
AGNES HAROLDSON Portland, Multnomah	VERA GLADYS ROGERS Tillamook, Tillamook
NORMA LILLIAN HELGESSON Portland, Multnomah	JOY ALDEN RUSSELL Merlin, Josephine
JUANITA MARTHA JENKINS Portland, Multnomah	HELEN DEANE SMITH Corvallis, Benton
MAUDE JENNINGS Umpqua, Douglas	MARIAN STEWART Lebanon, Linn
MARIE JOHNSON Portland, Multnomah	*LOIS ELIZABETH THURSTON Corvallis, Benton
LOIS EVELYN LAPHAM Portland, Multnomah	*LEWIS ARTHUR TROMP Lynden, Washington State
RUTH ISABELLE LEVAN Portland, Multnomah	GLADYS HELEN ULRICH Anaconda, Montana
MYRTLE ELIZABETH LOGAN Brogan, Malheur	AGNES ELLA WEATHERSON Florence, Lane
REGIENE LYTLE Jacksonville, Jackson	BELLE WILSON Harrisburg, Linn
	PALMER YOUNG Tacoma, Washington State

## MUSIC CERTIFICATE

ENID IRENE BEAL  
Corvallis, Benton

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\*Degree granted at close of 1925 Summer Session.

## MASTERS OF SCIENCE

**ARTHUR LEMUEL ALBERT**

Corvallis, Benton.

B.S., Electrical Engineering, 1923, Oregon Agricultural College.

Thesis: The Capacitance of High-Voltage Pin-Type Insulators.

**LEWIS ARROWOOD FLETCHER**

Corvallis, Benton.

B.S., Agriculture, 1923, The Clemson Agricultural College, South Carolina.

Thesis: A Study of the Pollination of the Sour Cherry, Prunes *Cerasus* Linnaeus.**WILLIAM MORGAN HIGBY**

Forest Grove, Washington.

B.S., Agriculture, 1924, Oregon Agricultural College.

Thesis: Removal of Plant Nutrients in percolate form from lysimeter tanks.

**IRENE CHINGAN HO**

Kai-yuan, Mukden, China.

B.S., College of Arts and Sciences for Women, 1923, Peking University, China.

Thesis: A Course of Study in Home Economics for Chinese middle schools.

**ELSA OTTILIA HORN**

St. Paul, Minnesota.

B.A., Science, Literature and the Arts, 1919, University of Minnesota.

Thesis: The Response of Mechanical Tissue to Tension in the Pedicel of Apple.

**KATHLEEN MELOY LAUGHLIN**

Corvallis, Benton.

B.S., Commerce, 1921, Oregon Agricultural College.

Thesis: A Preliminary Social Survey of Moro, Oregon.

**HERBERT STEPHEN MICHEL BROOK**

Salem, Marion.

B.S., Agriculture, 1923, Oregon Agricultural College.

Thesis: A Tentative Program for Vocational Guidance in the Rural High Schools of Oregon.

**NETTIE LORENE MURRAY**

Dallas, Polk.

B.S., Vocational Education, 1924, Oregon Agricultural College.

Thesis: Morphology of the Crustacean *Callinassa Californiensis* Dana.**JOHNSON ANDREW NEFF**

Marionville, Missouri.

B.S., Agriculture, 1924, University of Missouri.

Thesis: A Study on the Economic Status of the Common Woodpeckers in Relation to Oregon Horticulture.

**WILLIAM DAVENPORT SPOPE**

Corvallis, Benton.

B.S., Agriculture, 1925, State College of Washington.

Thesis: The Inheritance of Head Characters in a Species Hybrid of Wheat.

## DISTRIBUTION OF MEN AND WOMEN IN GRADUATING CLASSES

Degrees	1924-25			1925-26		
	Men	Women	Total	Men	Women	Total
Master of Science .....	8	.....	8	6	4	10
Bachelor of Science:						
Agriculture .....	76	2	78	77	4	81
Commerce .....	71	33	104	75	34	109
Engineering:						
Civil .....	18	.....	18	15	.....	15
Electrical .....	43	.....	43	40	.....	40
Industrial Arts .....	12	.....	12	13	.....	13
Mechanical .....	22	.....	22	24	.....	24
Forestry .....	12	.....	12	9	.....	9
Logging Engineering .....	3	.....	3	6	.....	6
Home Economics .....	.....	84	84	.....	67	67
Mines .....	10	.....	10	5	.....	5
Chemical Engineering .....	10	1	11	13	.....	13
Pharmacy .....	17	7	24	9	1	10
Vocational Education .....	12	39	51	15	42	57
Other Degrees and Diplomas:						
Graduate in Pharmacy .....	2	.....	2	.....	.....	.....
Pharmaceutical Chemist .....	13	1	14	14	2	16
Music .....	.....	1	1	.....	1	1
Totals .....	329	168	497	321	155	476

In connection with the report on "Geographical Distribution of Residence" given above, it is interesting to note the number of students in the graduating classes who transferred to the College from other institutions, as shown in the following tables.

## NUMBER IN GRADUATING CLASS TRANSFERRING FROM OTHER COLLEGES AND UNIVERSITIES

	1924-25	1925-26
Number entering by transfer .....	109	93
Number of institutions represented .....	50	44
States represented .....	20	14
U. S. territories represented .....	.....	1
Foreign countries represented .....	1	2

## GEOGRAPHICAL DISTRIBUTION OF GRADUATING CLASS

	1924-25	1925-26
Oregon .....	394	412
Other states .....	91	56
Foreign countries .....	9	6
Totals .....	494	474

Respectfully submitted,

E. B. LEMON,  
Registrar.

# REPORT OF THE EXPERIMENT STATION

To the President of the College,

Sir: At the end of each biennium the activities of the Experiment Station are reported in detail by departments and project investigations. These reports have now become somewhat technical, and of considerable length of necessity in order to make available to other stations and research agencies the full program of investigations under way in Oregon and to give enough information as to scope, plan, and progress of each project to enable coordination of work at this station with similar studies elsewhere.

Indispensable as these reports are, they do not give a picture that can be readily grasped of the part that research and experimentation by the Station plays in the development of agriculture over a period of years. Nor do they indicate in any concise way the great scope of the Station activities in research, experimentation and service. This fact and the fact that the responsibilities, activities and needs of the Station have so greatly increased since the World War, have prompted this attempt to picture as briefly as possible the present scope of the Station work; something of results achieved and their value to the agriculture of the state and the nation; something of the needs for further research and experimentation in the near future; and the extent to which the Station can meet these needs with existing man power and facilities. Individual mention of the several hundred studies undertaken during past years and at present is omitted.

## SCOPE OF STATION RESEARCH AND EXPERIMENTATION

### PRODUCTION AND RECLAMATION PROBLEMS

**Origin of Agricultural Experiment Stations.** The agricultural experiment station had its origin in Europe in 1852 when a group of Saxon farmers, constituting the Leipzig Agricultural Society, established the first farmers' station for agricultural experiment at the little village of Moeckern, near the city of Leipzig.

The following excerpt from an article on Agricultural Experiment stations in Europe is of interest as to the origin and development of these agricultural experiment stations:

"Moeckern was the first station where farmers themselves brought science to their own farms to aid them in their own farming. The example then given was so brilliant and solid that within two years another Saxon society, in the town of Chemnitz, set up a second station, and of the twenty-two years that have since elapsed, 1867 is the only one which has failed to witness the founding of one or more similar institutions in Germany or the neighboring countries. The experiment station shortly came to be regarded not as a costly embellishment or an agricultural luxury, in which universities or wealthy gentlemen might harmlessly indulge, but as a most remunerative and most necessary agency for the use as well as for the education of farmers."\*

\* Atwater, W. O., Agri. Exp. Stations in Europe, Report U. S. Dept. of Agr., 1875.



About eighty such stations were established in Germany in the next twenty-four years. They were started and supported largely by the farmers, until the government became convinced of the value of such stations and supported them with public funds.

About the time the farmers' agricultural station was being established in Europe, statesmen, farmers, educators, and industrial leaders of the United States became deeply concerned to provide opportunity for education and research for those engaged in agriculture and the industries. Michigan petitioned Congress for an agricultural college in that state in 1852. Massachusetts at about the same date sought the aid of Congress to establish a "National Normal, Agricultural College." Illinois, in 1853, petitioned Congress to donate to each state in the Union an amount of public land valued at not less than half a million dollars, "for the liberal endowment of a system of industrial universities."

This movement resulted in the Morrill Act of 1862 for the endowment of the agricultural and mechanical colleges of the several states, and the Hatch Act of 1887 establishing the agricultural experiment stations.

**The Hatch Act.** The Hatch Act set forth the purpose and scope of the experiment stations according to the needs of that time. Section two of this Act provides:

"That it shall be the object and duty of said experiment station to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies of the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural and artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States and Territories."

Little if any change in purpose and scope was brought about by the Federal Adams Act of 1906 except further to endow such stations and provide for greater attention to research fundamental in character, undertaken with adequate facilities and well qualified man power.

**Legislation by the state.** Federal funds from the Hatch and Adams acts are somewhat restricted in their use to investigations at the central station fields and laboratories or in operations from this station as headquarters. But Oregon is a state of many climatic and varied conditions of soil and agricultural enterprises, calling for research and experimentation to supplement the work at the central station and extend the benefits of scientific discovery to all parts of the state.

By an act of the state legislature in 1901 the branch experiment station at Union, Oregon, was established and provided with funds to "be used in connection with and for the benefit of said station for agricultural experiments in Eastern Oregon." By similar act in 1909 the branch station at Moro was established in cooperation with the Federal Department of Agriculture. The resources of the station were to be used

" . . . to secure seeds from this and other countries of the world, of plants that are thought suitable for growth on dry lands, and to observe and record the growth, yield, and composition of the plants grown from seeds so secured; to investigate and determine the methods of soil treatment by which the soil water is best conserved; to investigate the possibilities of grazing on dry lands which have been seeded to different crops, and to undertake such other experiments and demonstrations as may be deemed advisable, having in view the reclamation of the dry or arid lands of the state."

The branch station at Hermiston was established in 1909 in cooperation with the Federal departments of Agriculture and of the Interior "for experiments in Eastern Oregon and for providing scientific apparatus and tools for draining, tilling, and improving lands, and for all other purposes necessary for conducting and developing agricultural experiments in Eastern Oregon." In 1911 the branch station at Burns was established

" . . . to investigate and demonstrate the conditions under which useful plants may be grown on dry, arid or non-irrigated lands of the state of Oregon, and to determine the kinds of plants best adapted for growth on said lands."

In the same year the Southern Oregon experiment station was established at Talent "for agricultural experiments in Southern Oregon and not otherwise."

The John Jacob Astor experiment station was established in 1913

" . . . to investigate and demonstrate the conditions under which useful plants, grains and fruits may be grown on tide lands, reclaimed swamp lands and logged-off lands in the state of Oregon, and to determine the kinds of plants, grains, and fruits best adapted for growth on said lands."

In 1913 the Hood River experiment station was established "to study and carry on investigations in horticultural and pathological problems, as affecting the interests of the state of Oregon."

Meantime the increasing problems of irrigation, drainage, soil maintenance, horticulture and pest control called for expansion of work at the Corvallis central station. By a state Act in 1911, an appropriation was provided for "investigation of crop pests (economic entomology and zoology) and plant diseases (plant pathology), and horticultural problems in the state of Oregon." In the same year, appropriation was made and authority given the College for "scientific investigation of agricultural problems consisting of chemical, biological and physical investigations of soils as related to crop production."

By acts of the legislature in 1919 and by subsequent acts in 1923 and 1925 the Station was commissioned to carry on work in the "investigation of diseases of dairy and beef cattle, and investigations of problems in irrigation and drainage." By similar act in 1925 work was also authorized in "investigation of diseases of poultry by the State Agricultural College."

Under these several Federal and state acts the problems of agricultural production, reclamation, and crop and animal protection have developed in scope until few corners of the field are untouched. In many lines, however, investigations have been but limited and in no case has the investigation been adequate to the needs or importance of the problems.

## THE BUSINESS SIDE OF AGRICULTURE

**The Purnell Act.** For twenty years or more there has been an apparent and growing need of more facts from reliable research on the business side of farming. Meager data were collected along with research on the problems of production, but not enough.

By January, 1922, the need of reliable facts in this field was so great that the National Agricultural Conference, called in Washington by President Harding, devoted much of its time to consideration of costs, prices, and adjustments, foreign competition and demand, crop and market statistics, standardization of agricultural products, storage, credit, insurance and taxation, transportation, distribution and marketing, land utilization, farm population and the farm home, and agricultural research and education in these various problems.

Again in 1924 the President's Agricultural Commission considered these problems, and among its recommendations stressed the importance and need of "Fact Finding" by research in these new fields and recommended the passage of the Federal Purnell Act for "the more complete endowment and maintenance of Agricultural Experiment Stations."

This Act, passed by Congress and signed by President Coolidge February 24, 1925, emphasizes new problems from those of previous authorization and places new responsibilities on the agricultural experiment station. In the language of the Act—

"The funds appropriated pursuant to this Act shall be applied only to paying the necessary expenses of conducting investigations or making experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products and including such scientific researches as have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry, and such economic and sociological investigations as have for their purpose the development and improvement of the rural home and rural life, and for printing and disseminating the results of said researches."

In his statement to representatives of the colleges and experiment stations relative to the administration of the Purnell Act the Secretary of Agriculture made clear that the "Act recognizes in a substantial way the importance of finding solutions for the economic and social problems of the farm." A multitude of problems in these fields was cited for study. The scope of agricultural experiment stations under the Purnell Act is perhaps best indicated briefly by the investigations undertaken by the stations during the first year: In agricultural economics 224 projects, including 107 relating to marketing; 45 in economics and cost of production; 35 in farm management; and 37 on taxation, credit, land values, and miscellaneous; in home economics, 96 projects, including 37 studies relative to nutrition and food in general, 27 on vitamins, 29 on household management, and 3 on clothing and textiles; in rural sociology, 23 projects; in agricultural engineering, 16 projects; in protection against plant and animal diseases and insect pests, 99 projects; and in the field of production, 232 projects.

Because of the Purnell Act, the fiscal year beginning July 1, 1925, has been characterized by the Federal department as the "most conspicuous one in the expansion and development of the agricultural experiment stations since the national system was started" in 1887. It has meant enlargement of the field of research definitely to include all phases of



agricultural economics, home economics, rural sociology and agricultural engineering, and at the same time has placed added responsibility on the stations for new problems related to both production and the newer fields.

## WORK OF THE OREGON EXPERIMENT STATION IN RELATION TO AGRICULTURE IN OREGON

As indicated in the heading, the attempt here is to present phases of the Oregon Station work of the past or now under way which will give an idea of such research and experimentation in relation to the development and welfare of agriculture in the state. In carrying out this idea, many studies of the Station program are omitted entirely. For this more complete information reference is made to the regular biennial reports since 1922 and to the many bulletins and circulars of the Station.

**Staff cooperation.** The data presented represent the joint effort of the Station Staff as regards results accomplished and their preparation for this report. Due credit is hereby acknowledged to staff members.

The Horticulturist, the Chemist, the Pathologist, the Entomologist may at any time be of equal importance in the solution of a practical Horticultural problem. Likewise the Nutrition Chemist, the Veterinarian, the Dairy Management Specialist and the Bacteriologist and perhaps the Economist and the Crop Specialist may all be concerned in finding a solution to a practical dairy problem. In the solution of problems such as incubation for the poultry industry, the Agricultural Engineer and the Physicist are also needed.

The point for attention in this regard is the complex nature of many agricultural problems and the fact that solution of a single problem frequently requires attention from men of special training in several branches of science. The staff cooperation and morale are excellent in this respect and every effort is made to bring to the solution of each problem the best training and experience available.

## BENEFITS FROM EXPERIMENT STATION RESULTS AMOUNT TO MILLIONS OF DOLLARS ANNUALLY

It is difficult if not impossible to appraise accurately either the annual or the accumulated value financially to the agricultural industry, the state, and the people as a whole, as a result of the Experiment Station's work in the solution of difficult problems, in finding or developing important crops and methods, and in rendering scientific service. In some cases the agricultural enterprise involved would have to be discontinued unless a satisfactory solution to a single problem is found. In other instances a definite financial benefit can be estimated from an improved variety such as Federation wheat; from a cheaper source of materials used, such as the substitution of powdered lead arsenate for the paste form; or from a change in method such as the use of copper carbonate dust instead of the old bluestone treatment for control of wheat smut.

In the reports which follow, the benefits to the agricultural industry from the Experiment Station results are estimated in dollars and cents for a number of items. From these items alone, considered in a most conservative way, it is apparent that the benefits from accumulated results



of research and experimentation by the Oregon Experiment Station amount to \$5,000,000 to \$10,000,000 in the agricultural production of Oregon for one year. This is not surprising considering the great variation in conditions, the many highly specialized crops, the fact that so large a part of production is for distant markets in competition with products from production centers nearer consuming centers, and that the annual crop concerned aggregates one hundred million dollars or more, a large part of which is perishable.

This \$5,000,000 to \$10,000,000 value is distributed roughly as follows:

1. From the use of better farm crops introduced or developed, tested and recommended by the Experiment Station, and of improved methods of growing and marketing them .....	\$3,400,000
2. From the use of fertilizers as developed and recommended by the Experiment Station .....	1,180,000
3. From the use of methods developed by the Experiment Station for controlling crop diseases and pests .....	2,025,000
4. From the use of improved methods and improved varieties in fruit production, not including control of diseases and insects.....	400,000
5. From the use of higher producing poultry stock .....	1,000,000

Since the Extension Service and Resident Instruction have had much to do in aiding in the application of these findings in practice, the same items may be included wholly or in part as accomplishments of these divisions. The results of the Station's work in these matters, however, have formed the bases for the work of the other divisions.

These items do not include the assistance to the livestock industry, the dairy industry, or most of the assistance on general problems of irrigation, drainage, and soil fertility. Nor do they include benefits just beginning from findings such as the new spray method for reduction of pear blight, which one orchardist claims meant about \$10,000 to him in one year; benefits from solution of potato diseases—solutions imperative to the industry; benefits from part control of strawberry weevil and a score of other pests; benefits from legume inoculation, vaccine for hemorrhagic septicemia; or benefits which will accumulate rapidly from recent results in control of poultry diseases. Nor do they include invaluable assistance such as is being rendered in the present difficulty of meeting the spray residue problems in marketing fruit.

In other words economic values of a comparatively small number of items from the Station program are called to attention to indicate that benefits from such research run into millions annually when a crop of \$100,000,000 or more is considered; and further, to indicate that such research is imperative to the agricultural industry of Oregon if it is to compete for distant markets and survive.

## FARM CROPS

The largest and perhaps most important item of Oregon's agriculture is field crops. There is high degree of specialization in some lines; most lines are becoming more and more intensely competitive. The competition demands that the various enterprises keep in the forefront on new high-yielding varieties; on improved production and marketing methods; on the most economical and effective methods of disease and insect protection; and take advantage of opportunities for increasing new or old crops for which there are markets at fair price by replacement of crops not so well suited to Oregon, all conditions considered.

In these several fields the Experiment Station is assisting, and has been responsible for much that is acknowledged by farmers as of benefit far beyond the burden of Station maintenance.

## WHEAT

Since the war wheat has had an annual farm value of \$19,000,000 to \$44,000,000 in Oregon. Additional business in transportation, milling, manufacture, and export amounting to many millions of dollars is built upon the wheat crop.

The Experiment Station work looking to standardization on a few high-yielding varieties, of good market demand, free from smut and mixture, has been under way for more than 15 years. The benefits from this work have increased with accumulated data and have been especially marked the past few years. Instead of the sixty-three commercial varieties of ten years ago, eleven are now considered standard. The inferior ones have largely been replaced by varieties proved, through experiment, to be higher yielding and more desired by the market. This standardization, accompanied by certification of clean fields for sources of seed, has brought about steady decline in mixed and off-grade wheat as shown by Portland inspection records.

Receipts of mixed wheat at Portland have declined, according to the records, from 33.3 percent of the crop in 1918 to 8.4 percent for the year 1924-25. This decline of 25 percent has been steady and is largely due to standardized production. Part of it is due to changes in grades. Assuming that 18 of the 25 percent reduction in mixed wheat is the result of standard varieties, and applying that to an average annual production of 20,000,000 bushels, we have reduced the bushelage of mixed wheat by 3,600,000 bushels and have added that amount to the better grades of wheat. This improvement through better grade, worth 4 cents a bushel, has an annual value to Oregon of \$144,000.

**Improved varieties.** For the wheat-growing region of Eastern Oregon, the station at Moro has introduced and selected improved strains of Turkey, Early Baart, Triplet, improved Forty Fold, Federation and Hard Federation and others. These have almost completely replaced the less desirable varieties formerly grown. The real possibilities, as well as accomplishments, are indicated by Federation.

The Federation wheats are normally spring wheats. They were selected and recommended to farmers after years of painstaking work with a collection of commercial wheats of the world. Small lots of seed were distributed to farmers in 1921. They demonstrated the superior yielding quality claimed by the station. By 1924 they were planted on about 76,000 acres and yielded an average of 2 to 5 bushels more than spring wheats commonly grown. The gain from these varieties was estimated in value at about \$300,000. Winter wheats, however, are grown mainly in Eastern Oregon. A large acreage was killed by frost during the winter of 1924-25. Farmers followed the advice of the Station and re-seeded about 400,000 acres to Federation, paying a premium for the seed. It made an increase in yield of 2 to 10 bushels an acre over commonly grown varieties. Farmers' estimates of the increase were larger generally than those of the Station.

For the 400,000 acres grown the increase was estimated at  $1\frac{1}{2}$  to 2 million bushels with a market value of over \$2,000,000. Farmers paid the loans advanced by the state for seed and announced that Federation wheat and the Moro Experiment Station were due a large share of credit. Federation and Hard Federation have become the main commercial spring wheats in Eastern Oregon. They are proving of value in Southern and Central Oregon and in other states.

The investigations are going on with some 6,000 varieties, strains and selections of wheat under the same painstaking systematic study. Improved strains look promising to meet weaknesses of older ones. Two new selections of Hard Federation will be distributed to farmers for trial in 1927.

For Western Oregon Jenkin wheat is proving nearly as outstanding as Federation for Eastern Oregon.

**Improved methods.** The station at Moro was established in 1909 to assist in reducing the uncertainties and hazards of wheat growing in the big area now growing wheat after summer fallow. At that time good years intervened with low yields and crop failures. Average yields were low.

By years of careful experiments the Station found out and demonstrated on its own fields that early plowing for summer fallow increases wheat yields five to six bushels an acre. These results apply to practically all of Eastern Oregon where some 600,000 or more acres are sowed to winter wheat. At least 80 percent of the farmers in this region are now plowing from five to six weeks earlier than they did when the station investigation was started. Farmers testify that the change in practice brought about as a result of the definite findings has meant an average increase of at least three bushels an acre over perhaps 500,000 acres, aggregating 1,500,000 bushels annually having a net value of perhaps \$1,000,000 or over.

These and other changes to improved methods together with improved varieties have been fundamental to establishing wheat production on a somewhat substantial basis. Looking back now for a number of years failure of crop and the low yields of former years have not occurred. The certainty of production is now such that summer fallow has a loan value at banks before grain is planted.

**Smut control.** The problem of controlling smut in wheat has been a burden of expense and some uncertainties. Until a few years ago wheat farmers struggled along with the bluestone and formaldehyde treatment. They were afraid not to treat because of smut; to treat carried danger of killing the wheat. Copper carbonate treatment was first recommended in Australia. The Oregon Station made comparison with old treatments. Results were so promising that field tests were promptly started in co-operation with County Agricultural Agents with results confirming laboratory tests. Today, copper carbonate is used in treating the seed for perhaps 850,000 acres in Oregon. The result is better control of smut, easier treatment and an annual saving of about 300,000 bushels of seed wheat valued at \$375,000. The investigation and complete change has taken place since 1920.

**Smut-resistant wheats.** Wheat farmers have been watching with interest the Station research in development of commercial smut proof



wheats. Through selection, hybridization, and further selection the Station has created new smut-resistant winter wheats. Regal, a selection from a turkey wheat, has outyielded standard turkey wheats for four years in trials at the Station. No treatment for smut is necessary. About 250 bushels of Regal is being distributed this fall for trials by farmers. Other promising smut resistant selections are under further test. If Regal and its successors prove out as other station creations have done they will go far to eliminate the wheat growers' annual bill of about one-fourth million dollars for materials used in treating seed for smut and increase the growers' margin by that much.

**Production costs.** In cooperation with the Federal Department and the Extension Service of the Agricultural College a three-year survey of wheat farm organization and costs of production was made for the Columbia Basin. This was one of the most complete studies of the kind yet made. The data are fundamental to development of plans such as were worked out by the Economic Conference on wheat held in 1925.

**Marketing.** The Station has taken an active part in all movements affecting wheat grades. Standardization of varieties, control of smut, and creation of varieties more in demand by the market have had in mind marketing as well as production costs. Important as marketing may be, better and cheaper yields per acre, such as from Federation wheat, overshadow a market improvement of a few cents per bushel and are often a greater advantage proportionately in the keen competition as to what areas can remain in wheat production.

## OTHER CEREALS

The accomplishment of Federation wheat and the development of improved dry-land tillage methods represent the outstanding cereal results in Oregon because they apply to such a large area. They overshadow similar accomplishments, obtained by the same painstaking methods, but applying to smaller area.

**Barley.** Trebi barley has been proved as outstanding for the high irrigated areas; Mariout barley for some of the hot, dry sections; Hannchen barley for Western Oregon spring sowing; the development of OAC No. 7 barley for Western Oregon winter sowing. These barleys have increased the yield at least five bushels an acre on 34,000 acres—an increase in yield of 170,000 bushels worth about \$127,500.

**Oats.** Gray Winter, Victory, and Three Grain oats for Western Oregon; Markton, a smut proof oat for the hot, dry sections; and Golden Rain and Silver Mine for the high, irrigated sections are developments of importance to oat growers similar to the benefits from barleys and wheat.

The Experiment Station, anticipating the need for winter varieties of oats and barley in areas for which there is now no sufficiently hardy variety, is attempting to select and breed varieties for those sections. Progress is being made. To meet the need of the large oat milling industry in Oregon, as well as the need for a better feed quality of oats, the Station is working toward a gray oats with a higher percentage of kernel. Both winter and spring varieties of oats better suited to the great Coast region where rust is a serious limiting factor are problems under study.



Development of better oat varieties for Oregon has increased yield 4 bushels an acre for about 70,000 acres. The increase is valued at \$168,000.

Corn, not yet a major crop in Oregon, has increased extensively in acreage each year since the Station developed Oregon strains of Minnesota 13 variety. Oregon and the Northwest still send out thousands of dollars annually for corn. This amounts to 2,000 to 2,500 carloads of corn a year. More work is needed to develop better varieties of corn and to clarify certain production practices. The Experiment Station is unable, because of limitation of funds, to go extensively into these problems. The increase in yield through Minnesota 13 corn is at least one ton an acre on 40,000 acres. The annual value of such increase is worth \$200,000.

### FORAGE, HAY, SILAGE, AND PASTURE

Results in this field have been outstanding. In cooperation with the Federal Office of Forage Investigations research of a thorough nature has been under way at Corvallis for nearly twenty years. Each of the branch stations is doing some work for its respective locality. From this work have come a number of achievements of value to maintenance of soil fertility and permanent agriculture, of value to effective dairying and livestock production and of value as additional cash crops.

**Legumes.** But few years ago leguminous crops were of doubtful success in many sections and it is true that to start legumes and maintain them was difficult and expensive.

**Alfalfa.** The Station found, years ago, that alfalfa will grow on certain soils in Western Oregon and with lime and inoculation will grow on many other soils. Lime was expensive and the common alfalfa then available was short lived. Attention was therefore given to other crops.

With the introduction of Grimm alfalfa at the Union station and its subsequent proved qualities of winter hardiness, high yield, and long life, attention was again directed to alfalfa. After several years' experiments at Corvallis this crop was recommended for farm trials. Since the last census about 3,000 additional farms in Western Oregon have started alfalfa plantings of one to ten acres each. This remarkable increase is due mainly to Grimm alfalfa, better seeding methods, and cheap inoculation as a result of Station work and to cheaper lime. Alfalfa, a perennial, not only means less plantings, but gives an increase in yield of about one ton an acre.

Grimm alfalfa to Eastern Oregon means at least half a ton an acre increase in yield and much greater crop assurance through winter hardiness. The forty thousands or more acres planted to Grimm survived the cold winter of 1924-25 when common alfalfa was frozen out or thinned so as to result in low yields.

Grimm alfalfa is now used on about 60,000 acres of Eastern and Western Oregon. This means an increase of at least 30,000 tons of hay with a net value of about \$240,000.

**Clover.** The development of clover growing has been interesting. Many believed that this crop could not be grown in Western Oregon. Getting the crop started and maintaining it was a problem. Results from Station experiments on seed bed preparation, time of seeding, amount to

sow, inoculation, soil correction, have made clover a more successful crop. In the Coast region, lime, manure, and inoculation have been shown to assure clover growing where it is so much needed for the growing dairy industry. Further experiments are under way on methods of starting the crop, on breeding for strains or varieties to reduce losses by stem rot, mildew, and other troubles.

Ladino, a giant form of white clover, is showing great promise as a pasture crop for the entire Coast district, capable of nearly doubling the pasture yield. The Coast district needs such a crop. It is equally valuable for the irrigated sections. Burr clover shows possibilities for the development of pastures on logged-off lands where soils may be too sour for other clovers.

Trials of clover varieties from many different states and countries have been under way the past several years. Variation in vigor and productivity are promising for new clovers worth while in Oregon.

**Vetches.** Much of the Station forage work at Corvallis has been centered on vetch with a view of extending the acreage of legumes to meet real needs of Western Oregon agriculture and at the same time developing seed crops for which market is available.

Years of experiments have shown that Common vetch is probably the best vetch for general use as forage on well drained uplands where winter conditions are not severe. Selections of Common vetch are being made for specialized conditions. But there is need for vetch on much land other than well drained upland. This need is being gradually met by varieties selected from the great many introduced and worked with experimentally over years.

*Hungarian vetch* is probably the most outstanding introduction. This is an aphid-resistant vetch; it has much of the feed quality of Common vetch; it produces more seed than Common vetch; and is suited to soils too sour, too cold, and too wet for Common vetch. The first seed was released to farmers but a few years ago. There is now about 12,000 to 15,000 acres grown, extending the vetch area into some of the colder sections of Western Oregon and onto land too wet for Common vetch. The extension of vetch acreage and improvement of hay yield because of Hungarian vetch may be estimated at an increase in value of \$6 an acre on 10,000 acres, or a total value of \$60,000.

*Hairy vetch*, *Purple vetch*, and *Woolly Podded vetch* have been proved possibilities for other lands whose productive value and location is such that possibility of improvement through lime and other means is remote. In the Coast section these probably produce 1½ additional tons an acre of better hay from 2,000 acres—worth \$45,000.

Tangier peas, another introduction, have considerable merit as a silage crop in the Coast Region.

These vetches form an important part in the crop rotation plans of Western Oregon. They are becoming an important part of the legume feed needed by the dairy industry; especially in the Coast region.

In Eastern Oregon much experimental work has been done in the growing and utilization of field peas. Successful production of this crop for hogging off, sheeping off, for hay, silage, and seed has been proved at Moro, Union, and Burns. The crop is now being grown in many places on a commercial basis, especially for silage.

## GRASSES

**Pasture.** Much investigation has been done with grasses for pasture purposes. Along with it good results have developed in the production of grasses for seed. Of the many grasses tried under study the common rye grasses, timothy, orchard grass, tall oat grass, Kentucky blue-grass and red-top, seem to meet the pasture situation best in Western Oregon. Reed Canary grass has proved well suited to the wet lands; Meadow fox-tail for rather wet, heavy, and somewhat run-down soils of the Willamette Valley, and for many soils of the Coast district. The Bent grasses show good possibilities for pasture in extremely acid, wet soils of the Coast. Harding grass and a number of other highly exploited grasses have been studied. There is interest in Harding grass in California, but its place in economic production of pasture in Oregon has not been satisfactorily established. The price of seed is rather too high for economic use in Oregon and it appears not to compete successfully with other grasses mentioned that are substantially lower in cost of sowing per acre.

A number of pasture mixtures reasonable in price have been worked out as a result of the Station investigations. Superiority of these mixtures over common burn mixtures on the market has been amply demonstrated, and the economy of their use is now accepted.

**Green feeds and succulent crops.** Experimental work through many years has been done with succulent forms of feed for stock. Results thus far show that production of root crops, such as mangels, or of silage crops, such as peas, corn, or sunflowers, is most economic in the varying sections of Eastern Oregon; that production of root crops, such as mangels, of silage crops, such as corn, vetch and grain, or kale, is most economic in the Willamette Valley; and that root crop production appears most practicable in the Coast region, although in a number of sections silage is feasible. Through this work at the Astoria and Corvallis stations, it is now possible to provide green feeds for the dairy cows in these sections throughout the year. This green feed is usually supplemental to pasture during the seasons of the year when the pasture is not available, but by plans worked out by the two experiment stations, succulent or green feed can be provided for cows throughout lactation period. In certain instances, this is in the form of stored material, as silage or roots; in other instances, the green feed is pasture or harvested from the field.

Astoria Experiment Station results show that a substantially higher plane of milk production can be maintained where the cows have been provided with this succulent and green feed.

As a result of the experimental work in this field a complete change has been brought about in kind of mangels, turnips, and rutabagas grown. Many old standard varieties are exceeded in yielding power and general adaptability by new ones, as Sutton's Green Globe and Pomeranian White Globe Turnip, Improved Purple Top and Monarch rutabagas, Giant Half Sugar, Red Eckendorf, Danish Sludstrup and Prize Winner mangels. These new varieties exceed the yield of many of the old varieties by from 2 to 10 tons an acre. At 7 tons an acre on 2,500 acres of roots in the Coast counties there is a 17,500 ton increase worth \$87,500.



## SEED

Oregon has possibilities of developing a large seed industry in clovers, vetches and grasses. The Experiment Station has been working for years with experiments and encouragement for such development.

**Clover seed.** About 16 million pounds of clover seed is imported into the United States annually. This includes large amounts of red and alsike clover coming from all parts of the world. It is believed that equally good quality seed can be grown in sufficient amounts in Oregon.

Experimental work shows great difference in the adaptability of clover strains to various producing sections. Some clover seed of Western Oregon is unsuited to important clover buying sections. An inventory of Oregon clover seed strains is under way to determine those suited to the buying sections. Hardy strains from the buying sections are being secured and tried for seed production in Oregon. The object is to produce strains especially suited to certain localities and offer sealed pedigreed seed to such localities.

The clover seed industry of Oregon in 1926 is worth \$450,000. It can be developed to ten times this amount and still be within the needs of the United States.

White clover has been under experiment for years. Approximately a carload, worth about \$10,000, was produced in 1926.

**Vetch seed.** Common vetch seed is a staple seed crop amounting to about \$60,000 annually. Methods worked out by the Experiment Station are generally followed in producing the crop. Seed business in Hungarian vetch amounts to approximately \$50,000 in 1926. This is a new industry, largely local at present, developed the past few years since the Station introduced this new vetch. Purple vetch introduced by the Station is used for cover crops in California. The present business of about \$10,000 annually has possibilities for substantial development. Hairy vetch seed for consumption in Southeastern United States was produced to the extent of about \$35,000 in 1926. Production may be trebled. Seed production of this vetch followed the experimental work and recommendations. Increases in Common and Purple vetch increased seed production of Hungarian over Common, and new business in Hairy vetch probably amounts to \$85,000 annually.

**Grass seed.** Grass seed production is expanding as a result of Station experiments and encouragement. This includes orchard grass, tall oat grass, Bent grass, and rye grasses. There is good market for all these, although the limit was reached for rye grasses in 1926 with a crop worth about \$170,000. A new Bent grass industry amounting to about \$40,000 in 1926 consists in harvesting native stands of this grass in Coos and Clatsop counties as a result of Station observations. Recent conferences with an Eastern seed firm indicate their interest in coming to Oregon to grow several specialized legume and grass seeds.

The seed laboratory maintained cooperatively by the Station and the Federal department is responsible for maintaining good seed standards in Oregon. Thousands of samples are tested annually for farmers and seedmen. Its findings are commonly used in arbitrations over settlements on lots of seed.



## FLAX

The possibilities of flax in Oregon have been recognized. For this reason a limited amount of experimental work has been carried at the expense of research more urgent at the time. The data available are far short of what are needed for the best interests of developing both fiber and seed flax growing, yet Station results are of much aid through proof of the necessity to grow flax on good land; care in choice of varieties; planting shallow and early on a clean firm seed bed. Experiments have shown that planting fiber flax seed with a drill saves about 30 pounds an acre of seed and is the most successful method. On 2,500 acres of flax in Oregon the saving in seed amounts to about \$3,200.

## POTATOES

Experiment Station work with potatoes has been concerned with studies of potato diseases and their control and experiments in production and storage methods to secure better yields and more marketable potatoes at lower cost.

**Potato diseases.** Diseases are constantly a problem influencing both yield and quality to an extent that demands attention. Disease control is especially important to the maintenance of the important potato seed industry. The problems are difficult. Station research has been of high type and the results are duly appreciated by growers.

**Rhizoctonia.** This disease annually causes greater loss than any other in Oregon. The difficulty of knowing clean seed, the influence of diseased seed on yield, and the results from treatment recommended by the Experiment Station are indicated by a careful test in 1926: What appeared to be clean seed planted untreated produced 13 percent diseased sprouts, 11 percent diseased tubers and a yield of 200 bushels an acre; diseased tubers planted untreated gave 51 percent diseased sprouts, 46 percent diseased tubers and 196 bushels an acre; similar diseased seed treated by a standard method gave 2.3 percent diseased sprouts, 0.8 percent diseased tubers, and a yield of 265 bushels an acre.

These facts are not an exaggeration of natural conditions and indicate that possible profits may readily be changed to losses through lack of seed treatment. Experiments by the Station have shown that effective control can be secured by treatment with corrosive sublimate or hot formaldehyde. Experiments now under way indicate that still more effective results may be secured by a treatment with organic mercury.

**Wilt.** Potato wilt has caused appreciable losses mainly by directly reducing the yield. This disease and its control were under investigation for eight years by the Station and results published in 1926. It was found that the disease can be controlled by proper crop rotation and the use of a seed plot and a system of roguing worked out as a part of the investigation. The system recommended has been adopted to an extent that indicates its practicability in controlling this disease, which has been a cause of much concern to potato growers.

**Virus diseases.** For the past three years special attention has been given to a group of somewhat related diseases including rugose mosaic, leaf roll, witches' broom, giant hill, mild mosaic, calico, and mild inter-

venal mosaic. These disturbed conditions are the result of a so-called "virus" that can be transmitted from diseased to healthy plants and thus communicate the disease. The troubles are infectious but no visible organisms are known; they are tuber-perpetuated but can be readily detected only in the growing plants. They are generally spread from plant to plant by sucking insects such as aphids; spread to healthy plants often occurs without being detected before harvest; tubers from such infected plants will be normal in appearance but when planted will give rise to diseased plants.

This group of diseases is now one of the main causes of loss to potato growers. Their solution and the development of control measures are imperative to a thriving potato industry. Investigation for three years has been thorough and was strengthened in 1926 through Federal cooperation.

Control of virus diseases is a peculiar and particularly difficult task. Results secured, however, are encouraging as indicating practical and effective control methods being worked out.

**Production.** Production work in potatoes has developed along lines of cultural practices, use of fertilizers and in storage studies. The Oregon method of cutting seed potatoes is responsible for yield increases of seven to fifteen bushels an acre a year; data have been secured on the best size of seed pieces to use, thus making for greater economy in seed; the best depth of planting has been determined, which enables recommendations leading to greater production and less work in planting; coating the seed with land-plaster or sulfur has been proved a good practice for ease in planting and in yields secured. These improved practices bring increases amounting to \$300,000.

Time of planting in relation to yield and to disease infection is being studied. Spacing of potatoes in the row, having another bearing on the amount of seed to use per acre, shows that many growers are not planting close enough together to get the biggest yields. Cultural plans have been worked out making cultivation less expensive and more effective.

**Storage.** Potato storage is an important problem. Storage losses in potatoes probably amount to over a half million bushels a year in Oregon, much of which might be prevented with suitable storage. With such storage, carrying seed stock through in good condition, there is evidence that potato yields might be substantially increased. General principles for storage have been worked out, but there is much to be done to develop satisfactory farm methods.

## SUGAR BEETS

From time to time for nearly 40 years the Experiment Station has been working on sugar beets. Experiments have proved the adaptability of various sections of Oregon to the growing of this crop with sufficient tonnage and quality to make it worth while. In recent years the spread of the curly top disease by the leaf hopper known as the "white fly" has seriously reduced the production in the dry-land sections where beets are grown under irrigation. Recent investigations by M. B. McKay of the Station staff show that squash blight, Western tomato blight, bean curly top, originate from the same cause as curly top of beets. These diseases

in Western Oregon have not as a rule been serious, although they were troublesome in 1926. The yield and sugar content data would indicate a good future for beets under Willamette Valley conditions provided the curly top disease does not become a limiting factor.

### CONTROL OF GRASSHOPPERS

Occasionally outbreaks of grasshoppers have been responsible for serious losses through destruction of crops. Station entomologists worked on life-history and control of hoppers over a period of years and developed control methods which were followed with marked success during the last serious grasshopper outbreak a few years ago in Klamath county.

### MISCELLANEOUS

Obviously there are many lines of investigation in crop work that can not be touched directly by the Oregon Experiment Station. There are many phases of the broad lines under investigation that because of limited funds, lands, greenhouse facilities, and personnel, cannot be directly investigated. Consequently, many questions directed to the Experiment Station by producers and dealers in crop commodities must be answered on information based upon the study of experiments elsewhere and upon the judgment and personal experience of the person to whom the inquiry is directed. This service in itself involves a large use of time and in many cases has assisted farmers in directing their efforts along profitable lines and in other cases has enabled them to stay clear of production lines that offer little prospect of profit.

### THE HORTICULTURAL INDUSTRY

The first grafted orchard in Oregon was planted by Henderson Lewelling, near Milwaukie in 1847. Six years later Oregon apples sold for \$1.50 to \$2.00 per pound in San Francisco. In 1856 20,000 bushels of Oregon apples were sent to California. A large acreage was planted as a result of this market opportunity, which continued for 15 years. Then California orchards began to bear and Oregon's market was limited to home needs. As a result, apple growing was neglected for over 30 years.

The first Italian prune orchard was set out by Seth Lewelling in 1858. Between 1871 and 1880, Dr. J. R. Cardwell set out a prune orchard of 80 acres. By 1895 the prune industry had grown to 26,000 acres. There were limited market distribution and poor methods of processing and handling. Production beyond consumption was so great that many acres of prunes were pulled up during the late 90's. The remaining orchards were neglected.

The country was growing older. Insect pests and plant diseases not known in the earlier days took advantage of the orchard neglect. Codling-moth, San Jose scale, plant-lice, apple and pear scab, apple-tree anthracnose, and brown-rot of prunes and cherries became established. They are with us yet, a constant burden to the fruit industry through cost of control and injury to trees and fruit.

In 1902 Hood River growers obtained 85 cents a box net for Spitzenburg apples and in 1903 received \$2.00 a box. Such prices were obtained



for several years, both in Oregon and in Washington. Large plantings of apples resulted during the period 1900 to 1910, bringing the apple industry of Oregon to approximately 50,000 acres in bearing today, valued at about \$20,000,000 and producing an annual crop worth \$5,000,000 to \$7,000,000.

Prunes also came into favor again prior to the war and plantings were stimulated until prune trees of all ages totalled about 57,000 acres with an annual output of approximately 50,000,000 pounds of dried prunes and perhaps 20,000,000 pounds of green prunes valued at between two and four million dollars.

Likewise could be shown the development of pears, small fruits, cherries, peaches, walnuts, and filberts. They all make a fruit industry of perhaps \$60,000,000 investment and an annual crop value of 16 to 20 million dollars.

The vegetable industry has also developed until now approximately 4,200 acres of valuable land is devoted to cabbage, cauliflower or broccoli, celery, lettuce, and onions, together with an annual crop estimated in value at perhaps \$3,500,000, including home gardens.

A large surplus of products must seek distant markets in competition with products from centers nearer markets. This competition makes quality, attractiveness, and economic production imperative. These, in turn, increase necessity for effective control of diseases and insect pests, for facts on growing, harvesting and storage, and for information on markets and competing production elsewhere.

Such, briefly, is the horticultural industry which the Experiment Station is trying to assist. The problems are many and for the most part continuous. The examples which follow are far short of the complete program but will indicate the close relation of the Station work to the development and welfare of the industry.

## APPLES

**Apple scab.** As early as 1903 apple scab threatened the apple industry of Oregon. It thrives in the cool, moist climate of Western Oregon and Hood River. The Experiment Station began research and control experiments. In 1907, A. B. Cordley, then Station Entomologist, discovered that lime-sulfur would control scab better than any fungicide previously known. This discovery has revolutionized orchard spraying in all parts of the world. The chemist, the entomologist, the pathologist, and the horticulturist of the Station have since been at work to standardize and perfect the lime-sulfur sprays. Orchardists can now hold losses from scab to small amounts. Net gains from following the Station recommendations amount to at least \$500,000 annually.

**Pruning.** Among horticulturists throughout the world the Oregon Station is well known for the outstanding results of its research and field practice developed in orchard pruning. The fundamental research in orchard tree nutrition; the functioning of orchard trees and the balance of plant foods needed for consistent production; and the pruning practices based on results of these researches up to the present time are not spectacular, but they are far reaching. To say that 5 percent of yield, valued at approximately \$750,000 annually, is due to improved practice in pruning



based on results of research is perhaps conservative. Fundamental research in tree nutrition is still in progress.

**Soil fertility.** About a decade ago many apple orchards began to show depletion of soil fertility and decrease in fruit yields. Experiments in soil building and maintenance were undertaken at the Hood River, Southern Oregon, and Corvallis stations. Results and recommendations have changed cultural practices on Oregon orchards. Increases in yield and size of fruit from 25 to 40 percent have followed application of the new knowledge from research and field tests. The gain to the state has been estimated as high as \$1,000,000 a year. More important, however, is the fact that some such change in practice was imperative if the orchards were to continue an economic possibility.

**Codling-moth.** The codling-moth stands at the head of the list for destructiveness to the apple industry. This has been so for years; it is still so. Life habit studies of the insect; relation of temperature to egg deposition; combination spray mixtures to save time in combating both the worms and diseases; spray calendars for assistance of the fruit growers and studies of insecticides both as to quality and dosage; studies as to methods of applying the spray—these and others have been continuous problems. The codling-moth must be kept in control if the industry lives as a commercial industry.

The spray program worked out by the Oregon stations has reduced losses from codling-moth from about 12 percent in 1913 to perhaps 4 percent at present, where directions have been followed as in Hood River Valley, for example. The importance of this work is evident when 8 or 9 percent of a two million to three million box crop in Hood River Valley alone is considered. Apple and pear growers over the entire state save annually \$500,000 or more under present methods. There are still problems in codling-moth control—new sprays, removal of spray residue, more accurate data on life-history and relation of seasonal conditions to development and control of the insect.

**Orchard plant-lice.** As early as 1908 the brown, green, and woolly plant aphids of apples were causing serious losses of fruit. Control practices involved several spray applications and were but partly effective. The "Delayed Dormant" spray developed by the Oregon Station reduced spraying usually to just one application and increased effectiveness. The annual decreased cost of \$200,000 from reduction of sprays alone will go far to paying the annual cost of the Experiment Station to the state.

**Leaf-roller.** This insect appeared as a serious pest in Hood River Valley in 1911. It has since been causing serious damage there and elsewhere in the state. Without control, leaf-roller would cause a loss of at least 25 percent of the crop over a large acreage. Oil sprays worked out by the Hood River Branch Station have reduced the loss to about 10 percent—a gain of \$50,000 annually.

**Apple-tree anthracnose.** This fungus bark trouble actually threatened the existence of apple orchards in our moist climates at one time. Growers appealed to the Experiment Station; investigations of the organism causing the trouble were undertaken and the discovery was made that bordeaux spray applied before fall rains will control the disease. Application of this

spray saves at least 5 percent of tree value of apple orchards each year, or about \$500,000 annually.

**Perennial canker.** Within the past few years a strange tree canker appeared in apple orchards of Hood River. Orchardists saw ultimate ruin of their plantings unless control measures were secured. Thorough laboratory and field research determined the canker to be a hitherto unknown one. It has been named perennial canker. Control has been worked out by using bordeaux spray 6-6-50 supplemented by Black Leaf 40 solution and calcium caseinate spreader. Experiments have shown also that the canker control can be accomplished along with spraying for woolly aphis, thus saving extra labor.

## PEARS

**Blight resistance.** The research of Reimer at the Southern Oregon Station on pears, with special reference to blight resistance, is recognized as fundamental and productive by national authorities. The degree of resistance or susceptibility to blight of practically all known named varieties has been determined; a collection of world material is being studied, and breeding work undertaken with a view of developing root stocks, trees, and fruits resistant or immune to blight and of superior commercial quality. Winter hardiness, rate of growth, suitability for grafting, adaptability to different soils, susceptibility to insects and diseases, life of trees, and vigor in addition to resistance to blight must all be taken into account.

**Blight control.** Development of blight-resistant orchards, however, or even root stocks, is not accomplished in a few years. Meantime, the investigations and results of the branch station on methods of control by removal of infected parts; discovery of cyanide of mercury as a disinfectant for the freshly cut wounds and for tools used in blight cutting so as to prevent spreading blight while attempting control; and within the past four years reduction of blight infection by a spray of bordeaux at the right time, have been of inestimable value to the pear industry. One grower who tried this new bordeaux spray for blight prevention in 1925 reports as follows:

"This past year, one of the worst for the Valley as a whole, for blight, we followed the same program, and blight was a joke. We estimated our loss of fruit due to blight cutting this year at between 5 and 10 boxes, and the loss of bearing in young wood is nil. This is in contrast with an annual loss since 1916 averaging \$10,000 up to 1924, from loss of crop, trees and mutilation, together with the cost of resetting and labor of fighting."

**Harvesting pears.** A pressure testing apparatus devised a few years ago by the Station staff is used to determine the proper picking time of pears; it is used also to show the degree of maturity of both pears and apples in storage. About 90 percent of the pear tonnage of the state had its maturity determined by this tester in 1926. This instrument has been the means of saving from 10 to 20 percent of the tonnage of pears, by allowing them to remain on the tree until really ripe before being picked. The annual gain to the growers amounts to about \$35,000.

**Storage of pears.** Research on pear storage the past two years has discovered successful methods for storing the Bosc pear. In the near future, Oregon will be marketing from 1,200 to 1,500 cars of this variety. Up to the time this work was done, no successful way of storing this variety was known. The marketing season can now be extended from three to four months longer. In seasons of heavy production, this will have a marked influence on the sale price of pears in general.

**Pear production survey.** A thorough cost of production and enterprise survey of the pear industry in the Rogue River Valley is under way. This study covers 58 representative pear orchards, comprising 2,427 acres in bearing, which produce annually about 268,000 boxes. Records for each farm have been obtained for the past two years, and will be taken another year. Information regarding the economic status of the pear all over the world has been gathered for use in connection with the local data. The completed study will give pear growers reliable data on factors affecting costs and economic production and a "birds-eye" view of world's production and markets.

Studies of varieties, culture, pruning, pollination, fertilizers, and irrigation are under way and have already produced valuable data essential to progress in pear growing.

## PRUNES

**Fertilizers help old trees.** Experiments carried on with old devitalized prune trees in several different parts of the state, have shown that moderate amounts of nitrate of soda have increased the production about 25 percent on the average, and lengthened the life of the tree appreciably. Further investigations are being made on the rejuvenation of old prune orchards in parts of the Willamette Valley.

**Recirculation driers.** Several years' research in cooperation with the Federal Bureau of Chemistry showed the advantages in recirculating the air in prune driers by means of a multivane fan. Many new driers are being built with this construction, and old driers have been remodeled. Reports from prune growers show that approximately 25,000,000 pounds of the dried prune output of the state were dried by such driers during 1926 at an estimated saving of about \$150,000 in comparison with the old method.

**Prune harvesting.** Investigations during 1925 and 1926 on harvesting of prunes for shipment as green fruit have resulted in reliable facts on proper time of picking, and have shown how quality depends upon attention to time of picking. At the same time the application of the pressure test to determine maturity has been worked out. About 85 percent of the green prune tonnage of Oregon was tested for time of picking by this pressure test in 1926.

**Peach and prune root-borer.** This pest has been the most serious one peach and prune growers have had to contend with. Detailed life-history studies, mainly between 1916 and 1920, followed by studies of control methods, made possible the prompt adaptation of the paradichlorobenzene treatment. The ease of application and low cost of this treatment have resulted in its adoption by most growers in Oregon and is saving many thousands of dollars annually.



**Brown-rot.** This fungus is particularly bad on prunes, peaches, and cherries in Western Oregon. Methods of control were worked out and information has been so generally spread among farmers by means of spray programs, that losses have been materially reduced when recommendations have been followed.

**Prune enterprise survey.** A prune enterprise and cost of production survey has been under way for three years at the request of growers. Complete cost records have been taken on 111 prune orchards producing 5,000,000 pounds dried, per year. Many of the factors responsible for the wide variation of cost are already clearly indicated. The three-year study, soon completed, should make known factors in reduction of costs which are within control of the growers.

## CHERRIES

**Pollination.** During 1911, 1912, and 1913 Station experiments showed that the three leading sweet cherries of the state are not only self-sterile but intersterile—a startling fact, according to general knowledge at that time. Recommendations were made to top-work about 11 percent of the trees in commercial orchards to cherries suitable as pollenizers for the commercial species. Results in practice were not entirely satisfactory. Further research was undertaken in 1922 and continued three years. It was found that many of the varieties planted in the orchards are not true to name. Consequently, scion wood must be chosen from trees which have proved to be good pollenizers. Sweet cherry orchards are now being planned to provide for successful cross pollination. This should avoid an annual loss of from \$200,000 to \$300,000 on present young plantings compared to plantings before the research was done.

**Maturity of cherries.** Many sweet cherries have been picked in the past before the full amount of sugar had been formed and full size attained. This resulted in losses in quality and tonnage. A method of finding the proper degree of ripeness by testing the specific gravity of the juice has been worked out the past three years by the Central Station, and was generally used by the cherry growing districts during the season of 1926.

**The Cherry Maggot.** About 1911 the cherry fruit-fly, an insect causing wormy cherries, appeared in a few cherry orchards of Western Oregon. Investigations were begun which have resulted in the development of control measures that are safe, practicable, and applicable to Oregon conditions. Cherry growers and cannerymen feel that the spray program developed and recommended by the Station, and followed by the growers during the 1926 cherry season, produced the cleanest crop of cherries in many years and saved not less than \$75,000 to the industry.

The importance and control of brown-rot has already been mentioned under prunes.

**Cherry stocks.** Until a few years ago, one-third to one-half of the young sweet cherry trees died before reaching eight years of age. Five years' work at the Station proved that nearly all this loss could be avoided by using the Mazzard stock for a body and lower limbs, upon which the variety needed could be top-worked. This plan is now widely followed.



## PEACHES

**Peach blight and leaf curl.** Investigations begun in 1907 proved the success of using early fall applications of bordeaux spray to control peach blight. Later, it was found that winter applications of the same methods would control peach-leaf curl. This treatment has been the means of saving the peach industry in Oregon. The annual benefits amount to perhaps one-fourth of the crop, or nearly \$100,000.

## NUTS

**Walnuts.** Walnuts, like prunes, were dried in natural draft driers until experimental work by the Station the past few years showed that recirculation of air would bring about a great saving both in the cost of drying and in the quality of the product. Drying walnuts under the old method cost the growers about \$25 per dry ton. Drying under recirculation costs approximately \$10 per dry ton. The walnut crop of 1925 was approximately 600 tons. Of this amount, 125 tons were dried by direct recirculation driers at a saving of \$1,875.

**Filberts.** Until a short time ago, commercial filbert growing was held back by lack of information concerning pollination. The commercial varieties will not pollenize themselves. Research by the Experiment Station, covering several years, was completed two years ago. Different combinations of varieties are now recommended which will produce good crops when interplanted. Probably 4,000 acres of filberts have now been set out in the state. Most of them have provision for proper pollination due to this work of the Station.

Careful experiments in recent years have shown that filberts to be in good condition for eating, should contain 12 to 15 percent water. To maintain or to regain this amount of moisture, the nuts should be subjected to a relative humidity of 80 percent. This knowledge is of considerable help to grocerymen and others who handle filberts, as well as to housewives and growers in maintaining markets through quality.

## SMALL FRUITS

**Strawberries.** The Ettersburg 121 is a variety much in demand by cannerymen. Growers have attempted to produce this berry in many different localities of the state. Almost failure has resulted in some sections; in other sections the berry proved a great success. A careful field survey has been made the past two years to determine causes of success and failure. Soil type appears to be the main factor. This variety does best upon the heavier soil types such as the Willamette or Chehalis silty clay loam soils. This survey has opened up new territories for the development of strawberry growing for cannery purposes and will aid development of the industry.

**Loganberries.** Experimental applications of such fertilizers as nitrate of soda at the rate of 250 pounds per acre have increased the yields of loganberries as well as raspberries, about 10 percent on the average.

**Gooseberries.** The demand for gooseberries has increased greatly for canning purposes during the past few years. Gooseberry mildew,

however, was a great drawback to the industry until the Experiment Station discovered that lime-sulfur applied in early spring would control the disease on our principal commercial varieties. This proved to be a battle only half fought. Cannerymen soon began to turn in complaints of spoilage in canned gooseberries. Further investigations the past few years proved the sulfur to be to blame and finally worked out the time of application so that the fruit could be protected, by spraying before fruit setting time. This result served both the growers and the cannerymen.

## VEGETABLES

**Seed strain improvement.** Experiments over a period of years have shown that great improvement can be made in vegetables by careful seed selections. An unusually fine strain of Refugee stringless bean has been tested since 1923, and has proved to be of particular value to cannerymen.

Beet seed strain tests have shown wide differences in the value of strains. The canneryman is after a beet of good solid red color, light rings in the flesh being highly objectionable. Factors, such as soil management, climatic conditions, and seed variation have been studied in order that growers may be informed how these factors will influence color.

**Pollination of tomatoes.** Results over a period of years show that growers can improve the yields of their plants by 75 to 100 percent by consistent and careful pollination. This makes possible an increase of approximately \$7,500 to the tomato growers of the state.

**Insects of garden and truck crops.** A number of important control investigations of field and truck crop insects have been made. Of particular value are the investigations on the control of the grasshopper and the garden slug. The real value of these investigations in lessening crop losses is yet to be realized because of the failure, to date, of the general adoption of the improved control practices as developed.

**The European earwig,** while usually considered a menace to homes and real estate values, is a troublesome garden insect also. Studies undertaken by the Experiment Station have developed a poison-bran mash which, when carefully compounded and applied at the right time, will control this pest. Letters received from people who have used the mash illustrate the importance of the remedy in controlling the earwig in the garden and the flower bed. "A year ago we could not eat one head of lettuce out of our garden as it was black with earwigs. Now we have lettuce in the same spot—fine big heads. This is the result of last year's control campaign." "In the summer of 1924 I did not have a cut flower. This summer I used two packages of the bait and I can bring cut flowers into the house now without fear of earwigs."

**Insecticide investigations with sprays.** Oregon used about 750 pounds of arsenate of lead annually, costing the grower about 18 cents per pound, or \$135,000 annually. Investigations by the Station have shown that the powdered form is superior to the paste form of lead arsenate. This finding alone has saved from 3 to 7 cents per pound on lead arsenate, or about \$20,000 annually.

It costs approximately \$1.30 to \$1.70 per acre to apply a spray. By extended studies of compatible combination sprays it has been possible

to reduce the number of spray applications by from one to four. There are about 64,000 acres of bearing apple and pear orchards in the state; these findings would reduce the cost of pest control by at least \$80,000.

More intangible but equally valuable are the results of investigations on spray injuries and improved spray application. Under the unusually moist climatic conditions of Western Oregon and Washington, excessive spray injury is likely to occur with materials apparently 100 percent safe in the East. In years past reports of serious fruit drop or defoliation of orchards were fairly common. Today, even under the most unusual stress of unfavorable climatic factors, reports of serious spray injury are extremely rare.

### OTHER INVESTIGATIONS UNDER WAY

Projects are under way concerning costs of producing strawberries, rejuvenation of old prune orchards, irrigation effects on small fruits, and variety testing of small fruits.

Indications are that the present studies on spray residue will lead to an efficient and practical method of removing spray residue from fruit. Every effort is being made to solve this problem.

In the field of horticultural products, methods of making sirups for canned goods as well as tables for testing the degree of density at different temperatures, are being worked out and information sent to cannermen.

Work is in progress on the standardization of prunes. It is hoped to bring out of this investigation practical methods which will make possible uniform standard quality of prunes. This is imperative to desired improvement in markets and marketing.

**Strawberry survey.** A field survey similar to those reported for prunes and pears is being carried on with strawberries.

**Irrigation of vegetables.** Irrigation was installed and investigations started in 1926 to secure data on the cost of operating, obtain the overhead charges due to irrigation, and to compare yields of vegetables on irrigated and non-irrigated areas. Previous irrigation tests have shown considerable value in bringing forward early spring garden crops, and in enabling later crops to be started in midsummer during the dry season.

**Diseases of brambles.** On account of dying out of plants from unexplained causes, urgent requests came from many small fruit growers for help in solving their problems. A careful survey of field conditions, followed by studies of infected plants, showed that the troubles belonged to a group known as Systemic or Virus diseases. The following diseases of this nature have been found in Oregon: "Mosaic" on brambles—more especially on loganberries and blackcaps; "Leaf Curl" found only on red raspberries; "Bramble Streak" on red raspberries; "Dwarf" on phenomenal and loganberries, and some other systemic diseases not so well defined. Work is under way on these troubles with a probability that several years may be needed to develop remedies.

Investigations into fungus diseases of brambles have been made for several years. One of the most destructive of these diseases is the "Blue-stem" of black raspberries, caused by a species of *Verticillium*. Observa-



tions indicate that the disease is apt to be more severe when blackcaps follow potatoes. Young plants for setting should be taken from a patch free from disease. Work is in progress on this disease.

## THE BULB INDUSTRY

Climatic and soil conditions in parts of Oregon are well suited to the growth of bulbs. This is a new industry and bids fair to become of considerable importance. Like other new projects, the industry has many new problems to be solved regarding the culture, insect pests and the diseases of bulbs. Experiments on a small scale are being started to test out methods of cultivation, contrasts of irrigated and non-irrigated bulbs, control of various bulb diseases, and the combating of such insects as the Narcissus Bulb Fly and the Lesser Bulb Fly, which have been introduced from Europe, and for which life-histories, habits, and control must be worked out for Oregon conditions.

**Insect pests.** The Oregon Station has under way studies on the life-history and control of the strawberry root-weevils, prune thrips, gooseberry borer and red spider-mites. The codling-moth control studies are being continued with the purpose of ascertaining the value of "spreaders" and oils in the spray program.

## PROBLEMS NEEDING ATTENTION

In the field of horticulture, investigation is demanded by the needs of the industry along the following lines: Hardiness of fruits and fruit stocks; studies of transpiration of tree fruits in midsummer; studies of root growth in winter; breeding of fruits; pollination of pears; variety trials of fruits and vegetables; further production and marketing studies on increasing fertility and conserving soil moisture; selection of suitable walnut seedlings for named varieties; investigations into cranberry problems, particularly weed control; trials of eastern blueberries under Oregon conditions; storage and shipment of vegetables; and problems of mint growing.

**Entomology.** Outstanding insect pests that are doing damage and for which urgent requests for investigation have been received are as follows: The pea weevil, strawberry crown-borer, syneta leaf beetle, the walnut codling-moth, the beet leaf-hopper, plant lice disseminating disease, raspberry root borer, woolly apple aphid, western 12-spotted cucumber and bean beetle, gooseberry maggot, cucumber and melon seed maggot, and bulb mites.

These are pests of economic importance now. The Station has been appealed to by resolutions or otherwise for immediate investigation into methods of control. This cannot be done with present funds.

**Plant diseases.** In the field of plant diseases walnut blight broke out with unusual severity in 1925 and again in 1926, and growers have urged investigations on control, which is as yet unknown. In 1926 the crop loss is estimated at 1,500,000 pounds of walnuts. Filbert blight has caused increased concern with the recent rapid increase in plantings, since loss of half the trees in the second and third years is a common story. Serious diseases of asters, tulips, narcissi and other ornamental plants



have placed the growers in some instances in a precarious situation and have brought insistent demands for investigations.

During 1926 there was an outbreak of a peculiar disease affecting a number of important crops resulting in many active requests for investigation. Preliminary surveys and greenhouse tests identified the trouble on all these crops to be the same as "curly top" of sugar beet. The fact that 75 percent of the beans grown east of the Cascades, half or more of the tomato crop, half or more of the squash yield, \$12,000 worth of the horseradish crop, and a considerable part of the beet crop in Oregon this season were lost from "curly top" attack shows that the growers' requests deserve attention.

Serious losses from root rot of canning beans in Lane county in 1925 brought a demand for work by the Experiment Station on this unsolved problem.

There are numerous minor problems of real, if only of local importance, which continually reappear, accompanied by requests from individual growers or groups for investigation or for information on control, which can only be obtained by investigation.

Existing financial resources cannot, however, meet these demands.

## THE POULTRY INDUSTRY

### BREEDING ACCOMPLISHMENTS NATIONALLY RECOGNIZED

**Selective breeding for high producing flocks.** Experiment Station work for the poultry industry in Oregon was begun in 1908. There was not a commercial flock in the state at that time; there was not a trap-nest in the state; farm flocks were about on a par with those throughout the country; poultry products were being shipped into the state in spite of the fact that agriculture had been developing for nearly a century.

James Dryden, then head of the Poultry department, believed in the poultry industry and was a man of ability, enthusiasm, and vision. He set about to determine the possibility of increasing egg production of Oregon's flocks by selective breeding. Foundation breeding stock of white Leghorns and Barred Plymouth Rocks were gathered together from several flocks. During the first year, 1908-09, the 63 selected white Leghorns averaged 106.88 eggs, the 113 selected Barred Plymouth Rocks averaged 86.14 eggs.

The poultry work of the Station was concentrated on this selective breeding project. Results were remarkable: During the year 1912-13 the white Leghorn flock averaged 208.93 eggs; the Barred Plymouth Rocks 179.56 eggs. In this year, too, these flocks produced the first 300-egg hen in the world, a white Leghorn. The value of this hen would be hard to estimate. More than 100 articles were written about her. The publisher of one article estimated that it was read by 16 million people. Articles were published in national papers regarding the breeding, care, feeding, and management of the flocks to produce these records.

The breeding investigation was expanded and continued until 1922 when Dryden concluded and published:

1. High fecundity is inherited.
2. Selecting breeding stock on the basis of annual trap-nest records regardless of prepotency or tested qualities is a certain method of increasing egg production.

3. Some hens and some males have the power of transmitting high fecundity; others have not this power. More rapid progress will be made in increasing production of the strain if only those hens and those males be used in the breeding pens that have shown by the egg records of their pullets or by the progeny test that they possess the power of transmitting high egg production.

Meantime the poultry industry of Oregon developed rapidly. Instead of importing eggs, today high quality eggs are marketed on distant markets by the car-load; the annual production of poultry and eggs is estimated at ten million dollars; Oregon has become known as a center of poultry breeding; commercial flocks averaging 200 eggs per bird are not uncommon; the general average increase in production since 1909 is estimated to be at least one-third, from 75 eggs to 100 eggs per bird.

That the Station results from research in flock improvement have had a profound influence in bringing about this change and development, would hardly be doubted; any claim as to the tangible value of this influence is not easy to prove. It is a fact, however, that thousands of eggs from the Station high laying strains and hundreds of cockerels have been shipped to all parts of the state and have become the foundation stock for farm flocks. It is an advertised fact, also, that one of the most successful and widely known breeding farms in the state, with flocks making national and international records, is built upon foundation stock from the Oregon Agricultural College Experiment Station stock.

Considering these facts and the development of the present ten million annual industry in the state, it is perhaps not exaggerating to estimate the benefit of the results from station research at \$1,000,000 annually.

**Selective breeding to extend profitable life of laying hens.** Selective breeding and flock improvement are not matters of one year or one period. They are fundamental to continued maintenance and progress. Following the completion of the investigation briefly reported above, the Station undertook and is now continuing research on another important breeding problem.

Renewal of the flock is one of the main factors in commercial and farm poultry production. Previous work has demonstrated that the pullet year is the most profitable year in the life of the hen. The average hen seldom produces eggs at a profit for more than two years. It is necessary, therefore, to reproduce the flock every other year. Not only is this expensive but should the poultryman meet with difficulty in hatching, feeding, and rearing his flock he is handicapped. Laying strains which would produce profitably over three or more years would reduce expense and increase the farmer's margin greatly.

During the breeding project briefly discussed, the Station had produced not only the first 300-egg hen but had produced the first hen to lay 1000 eggs in her lifetime. There have since been produced in the Station flocks 45 individuals laying 1,000 eggs or more. Of these, 11 have produced 1,000 eggs in five years or less.

Can strains of white Leghorns and of Barred Plymouth Rocks be produced from this foundation stock which will lay profitably for three or more years? The Station started selective breeding in 1923 to find out. Like the former investigation, this is one involving time, ability, and expense before conclusions are reached. The project is financed as the first

study was, mainly from Federal Hatch funds. That progress is encouraging is indicated by records for the year just closing:

A pen of 200 Barred Plymouth Rock pullets from this new breeding stock has recently completed the first year's laying. The average production for the 200 birds was 233.9 eggs. Nine of the pullets, nearly 5 percent exceeded 300 eggs each. One of the flock laid 325 eggs, equalling the world's record for this breed and establishing a new national record. The world's record has later been raised to 326 eggs by a Canadian hen. The pen record so far as we can learn is a world's record.

Increase in profitable laying age requires vitality, and the flock was carefully watched in this regard. The loss during the year was 7 percent. Recent figures from farm flocks in the Mississippi Valley indicate a mortality of 13 percent and this ordinarily is considered favorable.

The record of this flock is attracting world attention and points to the possibilities of the research. Its ultimate meaning and value to the industry of the state is a matter of the future.

### ASSISTING IN THE CONTROL OF POULTRY DISEASES

With the development of specialized poultry farming, other important problems have arisen. The maintenance of health, vigor, and vitality are matters of feeding, management, and disease- and pest-control as well as of breeding. The State Agricultural Economic Conference in 1924 reported that "the disease problem, with its contributing factors, is the greatest limiting problem of all in the poultry industry." Losses were estimated at not less than one million dollars a year, of which one-half should be saved by knowledge through research on some of the major troubles.

Station veterinarians and poultrymen have for years been rendering such assistance as possible without opportunity for real research into the main troubles, due to lack of funds. In 1925 poultrymen appealed to the State Legislature and secured an appropriation of \$5000 annually for research in this field. A poultry veterinarian was employed and provided with laboratory facilities in August, 1925.

Although this work has been in progress less than two years, tangible results have already been obtained on Oregon poultry farms. Many poultrymen have controlled coccidiosis through adopting the recommendations of the Experiment Station. Approximately thirty thousand birds will be tested for bacillary diarrhea this year. The Washington State Department of Agriculture has issued an order quarantining against all baby chicks and breeding fowls which originate from flocks not tested for this disease. Thus, if this laboratory were not available, it would be very difficult for any of our poultrymen to comply with this regulation.

Chicken-pox has been controlled in several flocks with a method of vaccination recommended by the Station which had not heretofore been tried in America. If this proves to be as satisfactory as it seems at present, it will revolutionize the control of this disease.

### ECONOMICS OF POULTRY PRODUCTION

The College has been appealed to for reliable facts as to the possibilities of commercial poultry production in Oregon. The Federal Department has approved expenditure of Federal Purnell funds for a study in this field.



The investigation was begun during October, 1926, according to careful plans and according to approved methods of research.

This study aims to determine the costs and profits of the industry and the factors responsible for variation in costs and net returns, with special attention to those within control of the poultrymen.

The results should be of real value to poultrymen in adjusting their farm organization to the most profitable bases and of greater value perhaps in directing agricultural development along the right lines.

## RESEARCH ON OTHER PROBLEMS URGED BY POULTRYMEN

**Diseases.** The Station Staff in 1924 estimated that a minimum of \$7500 annually would be required to carry out the disease investigations urged and requested by poultrymen, the College providing housing and all overhead supervision. The fund provided was \$5000, and necessarily part of the program has been deferred. Poultrymen are disappointed in this and are making effort to provide for the original program. The need and possibility of curtailing losses by such work have been carefully considered and there is little doubt that returns on the investment to the state from such further studies would be many fold.

**Feeding investigations.** New feeds and new methods of feeding developed in recent years by eastern experiment stations have been much advertised. If they will work, our poultrymen will profit greatly by saving in labor, reduction of difficulty from overfeeding and underfeeding, and from general ease of management. It is a problem, however, whether the new methods can be profitably followed under Oregon conditions of high production flocks. Naturally the poultrymen of the state are vitally interested, and through communications to the President of the College have urged that the Station make an investigation in this subject under properly planned and supervised conditions. This would involve an additional expenditure of perhaps \$5000 in experimental hatching; brooding, and rearing equipment, in addition to the outlay of man power to make observations and determine the results. The investigation is one of real merit but cannot be undertaken in the near future with funds and facilities available.

## THE DAIRY INDUSTRY

A profitable dairy industry depends upon: good cattle; good feeding and management; good health; and good markets.

Thirty or forty years ago few problems, if any, were recognized by the dairy industry of the state. Farms were producing less than the population consumed; prices were relatively good; cattle were not crowded together on small farms; efforts at high production had not brought about constitutional weaknesses among the cattle and had not developed the artificial conditions obtaining at present. Animals were kept under normal conditions with plenty of range. There was little disease.

Conditions have changed. Cattle have been improved until Oregon is known as a breeding center for high-producing cows. This type of cow will produce perhaps six times as much as the cow of a few generations ago; the size of farms has decreased and cattle are kept in close contact within lots or small pastures, making the spread of disease more



common; high production means a drain upon the constitution and increase in susceptibility to disease; refined foods have opened the question of malnutrition. Oregon no longer consumes more dairy products than are produced. Dairy products must be shipped to find markets elsewhere. This means competition with products of the world. This competition means measuring up in quality, attractiveness, dependability of supply and price. This, in turn, has developed a marketing problem with its relationships to manufacturing, standardization and the basic problems of economic production.

These later conditions have developed a comparative need for reliable facts from research and experimentation beyond the funds and facilities of the Oregon Station. Since 1915, however, creditable progress has been made, especially in research on diseases, nutrition, feeding and management, and something on economics and marketing.

### RESEARCH TO PROTECT HEALTH OF DAIRY CATTLE

**Infectious abortion.** This is the most serious infectious disease of dairy cattle in Oregon and was therefore the first to be attacked by the Station. Field studies including many thousand dairy cattle have shown that approximately 25 percent of Oregon's 225,000 dairy cows are infected with this disease. Studies of records in herds containing both abortion-infected and abortion-free cows have shown that the average milk yield of infected cows is about one-fourth less than that of normal cows. The economic losses, therefore, are large.

In 1915 the Experiment Station began studying the disease in the College herd, which had been contaminated through buying and introducing abortion-infected cows. Up to this time practically all the work which had been done with infectious abortion at the various Experiment Stations had been with the cause and the pathology rather than with methods of spread and means of control.

In 1919 the Legislature made a special appropriation for the study of diseases of cattle and the scope of the work was very materially enlarged. The method of transmission from one animal to another, the susceptibility of animals of various ages, and methods of controlling the trouble were studied, always keeping in mind the economic effects of methods attempted. The work done at the Oregon Station was the first of this type reported in this country.

As a result of these studies, methods were worked out whereby the disease was eradicated from the College herd. These same methods are being tried in the field under practical dairying conditions. Progress has been most satisfactory in these field herds. In a little more than 30 herds on the Hermiston project, where such work has been in progress for four years, the percentage of reacting cows is now about one-fourth what it was at the beginning. In several herds in the state the disease has been eradicated just as satisfactorily as in the College herd. In all instances these field results have come from voluntary cooperation on the part of the owners. Provided the percentage of infected animals is the same, it seems at present that it is not more difficult to eradicate abortion than it is to get rid of tuberculosis. This is considered real progress—a mile post, in fact.

**Sterility in bulls.** Field studies in Tillamook county with more than eighty bulls showed that approximately one-third of them were either sterile or fertile only a part of the time. Breeding tests with these animals agreed with the microscopic findings. These studies proved that it is practicable to make microscopic examinations at the beginning of the breeding season and eliminate the sterile bulls. This procedure in the Tillamook district decreased the breeding troubles at least 50 percent according to a report from the practicing veterinarian in that county.

## FEEDING AND MANAGEMENT STUDIES

**Nutritional problems.** Coincident with the studies on health, it was observed that there were many evidences in this state of nutritional disturbances. Indications of mineral deficiency were noted with considerable frequency among high-producing cows. The question of the relationship between minerals and vitamins was also raised. No experiment station in the West had ever undertaken the study of mineral metabolism with the feeds raised in the West. The only information at hand was that obtained from the work of Eastern experiment stations. There was no evidence that work of this nature was applicable to conditions decidedly different in other geographic regions.

Beginning in 1921, a study was started to determine what mineral deficiencies, if any, existed in this state. It has been found that there are deficiencies of phosphorus and calcium. More significant, however, is the demonstration that the utilization of minerals in ordinary feed stuffs is greatly increased by the addition of kale, a green feed grown for winter use in Western Oregon, and that by the addition of bone-meal to the ration, any mineral shortage suffered by the average cow is corrected. This has enabled the Station to make recommendations that will, so far as known at the present time, take care of the common mineral deficiencies of Oregon's dairy cows at a minimum of expense. This is by no means the last word in this field, but it does mean substantial progress of immediate practical application and economic value.

**Feeds.** For years, feeding investigations have been under way to work out the most economical feeds, considering what can be grown, costs and results in milk production or maintenance of the producing and non-producing cows. These investigations have done much to aid in developing a production and feeding program of legume hay, silage, root crops, green feed, grain, and concentrates for the best interests of the dairy industry in the Willamette Valley and Coastal region. After all, economical production depends much upon economical satisfactory feeds. With changing conditions, new information, new feeds coming on the market, work in this field must be in progress most of the time if the Station is to answer the multitude of questions referred to it.

**Pasture.** The experimental data indicating the value of green feed in the form of kale for winter in Western Oregon directs attention to possible new values for pastures in maintaining proper nutritional balances. A careful survey of pastures, exclusive of the Coastal region, shows that they are productively efficient but about two months each year. Cows reach their lowest production in the heart of summer. If they had adequately suitable pasture they should be producing only slightly less than their maximum production in May. This raises another problem of economic as well as nutritional significance. What is the effect of pasture on

the cost of production? What is the effect of pasture on the physical condition of the animal and her ability to resist disease? If she had good pasture, would her production be higher during the succeeding winter months because of the effect of pasture during the previous summer? These are some of the many questions that naturally occur as a result of the investigations already made. The very nature of them suggests their fundamental character from both a nutritional and economic point of view.

Research of this type cannot be done by one man. The dairy husbandman, the physiologist, the veterinarian, the pathologist, the chemist, the economist, and the farm-crops man all play an important part in studying problems of this nature. Investigations in this field have been started. Such problems cannot be solved in a short time, nor can one at any writing state when they will be solved. Just as long as we continue to develop our industries both on the farm and in the plant, under the pressure of greater economy of production, just that long will a variety of management problems continue to force themselves upon us. The whole plane of production that the dairy industry is reaching is an artificial one. This can not be avoided, for the cow of today is the same physiologically and anatomically as was the cow of 50 years ago. Part of the price of civilization is the necessity of meeting these problems.

**Marketing.** As already mentioned, the changing economic conditions which have made Oregon an exporting rather than an importing state have suddenly brought forward a series of most difficult economic and marketing problems. The Experiment Station began giving attention to this field several years ago in a limited way. When Federal Purnell funds became available in 1925 a study of factors involved in the marketing of butter by Oregon creameries was undertaken and completed in cooperation with the Federal Bureau of Agricultural Economics. The response from the industry indicates appreciation of this investigation and report. Already progress has been made in correcting butter marketing conditions as recommended.

In June, 1926, a comprehensive study of the milk marketing situation in and about Portland was undertaken with Federal Purnell funds and cooperation of the Federal Bureau of Agricultural Economics. The data are now being compiled into a report, and it is expected that the information will be of help to both the producers and distributors of milk.

### IMPORTANT PROBLEMS FOR FURTHER RESEARCH

Research on the major problems, discussed only briefly, should by all means be continued vigorously. The results thus far are from the period of only a few years since financing was made possible with state and Federal funds.

There are many other problems of importance to merit attention. A few merit serious immediate consideration.

**Breeding troubles.** The largest livestock business in Oregon is the cattle industry. The 225 thousand dairy cows represent a value of nearly 15 million dollars while the 500 thousand beef cattle are worth



about 15 million more. The annual income from the combined dairy and beef industries is approximately 30 million dollars. One of the big causes of losses in the cattle business is breeding difficulty. The number of calves dropped in the range country is only about two-thirds the number of breeding cows running on these ranges. It is estimated that about 10 percent of the dairy cows of the state are permanently sterile and that at least another 20 percent are not regular breeders. A limited survey in one dairy section including some 80 bulls showed that about one-third of them were either temporarily or permanently sterile.

Investigations made at this and other stations have resulted in the discovery of methods of diagnosing sterility and in some types treatments have been worked out. But cattle owners realize that information concerning the prevention of these troubles is much more important than methods of treating individual cases. Both dairymen and beef men are asking for information concerning the entire breeding problem.

This is one of the most complex of the research problems confronting the investigators studying the livestock industry. The underlying principles probably involve heredity, physiology, and nutrition as well as methods of management and pathology. Fundamental studies should very probably be cooperative and should include consideration of all these factors.

Work of this type will of necessity be very expensive as considerable numbers of cattle will have to be handled in these studies. This is a long-time problem, moreover, requiring the rearing of calves from birth to maturity under controlled conditions.

**Butter standardization studies.** The investigation of butter marketing made apparent a need for facts upon which to base a program of standardization for Oregon butter to insure a uniform quality which will meet consumer demand in available markets. The methods and progress in Iowa, Minnesota, and elsewhere, where such work is under way, have been looked into and plans are being developed to undertake such studies with Federal Purnell funds in the near future.

**Cottage cheese.** The use of cottage cheese has increased tremendously during the last few years and has made possible a great increase in per capita consumption of dairy products. Cottage cheese making is yet an art. Not enough facts are available for it to be considered a science, but there is great demand from the manufacturers and others interested in the industry for information that will put it on a scientific basis. There is practically no available information of a scientific nature on cottage cheese making. The importance of the industry justifies giving it attention.

## ANIMAL INDUSTRY

### HOGS, BEEF CATTLE, AND SHEEP

The main results to take definite form in this field during the past two years have been along economic lines. Cost of production studies have been under way for years, including range studies, wintering, fatten-



ing, breeding, and marketing. During the past biennium results of these investigations have been published as follows: "Cost of Producing Mutton on Eastern Oregon Ranges" as Station Bulletin 219; "Cost of Producing Beef on Ranges of Eastern Oregon" as Station Bulletin 220; "Cost and Profits of Sheep on Irrigated Farms" as Station Circular 62; while a bulletin on "Cost of Producing Sheep in Western Oregon" is about ready for press.

In addition, new data have been obtained on costs of horse-power; feeds and feeding for hogs, cattle, and sheep, breeding of range cattle and breeding troubles of sheep in Western Oregon, pastures for sheep, and on clearing land with goats.

Results of importance in this field, however, are rarely secured from experiments of a year or two. They are cumulative, built up. They have a real meaning only when considered over a period of years, along with a picture, or story, of the industry—its problems, its needs, its development and readjustments to changing conditions.

The opening of the present century found the livestock industry of Oregon in a state of rapid evolution. The old days of wide-open, free range were passing and the stockmen were forced to look forward to a new era, to changes in methods, and perhaps to an entirely new plan of operation. This process of change has continued, somewhat diminishing in extent, down to the present time. Among the changes that have been initiated with varying degrees of success are the winter fattening of steers, production of early maturing beef including baby beef and yearlings, heavier winter feeding, the use of silos, winter lamb fattening, discontinuance of wether production, early lamb production, expansion of the hog business, and radical changes in the entire breeding program. These were all problems about which stockmen knew little in 1900, and unfortunately the Experiment Station could give no immediate assistance since it had done no work along this line.

### DEFINITE STATION PROGRAM BEGUN IN 1910

Beginning with 1910, the Station investigations were shaped around a definite objective: ultimately to obtain a knowledge of animal husbandry which would make it possible to plan livestock enterprises in advance with a reasonable assurance as to the outcome, just as the engineer in planning a bridge knows in advance what load the bridge will carry; or to express it differently, to obtain data that would enable the individual stockman to put his business on a budget basis, and enable the state to work out a livestock production program based upon known facts.

**Hogs.** Hogs were given first attention, partly because equipment for that work was available and partly because the hog industry was then in a state of confusion and the demand for information was insistent. Feeding value and proper methods of utilization for various Oregon feeds such as wheat, barley, oats, rye, middlings, shorts, skim milk, buttermilk, tankage, fish-meal, cocoanut-meal, molasses, garbage, alfalfa, rape, and clover were secured through careful feeding experiments. A study of the resources of the state and of the demand for pork and pork products was carried on at the same time.

By 1916, data were accumulated that made possible a definite program for hog production in Oregon, based upon facts according to the time. It was shown that a definite ratio exists between the cost of producing pork and the price of grain, and between these two items and the market price of pork. It was shown that the feeding of farm grown grain to hogs in Oregon would just pay its way, but that any waste products which were used in addition to the grain would be clear profit. It was shown that the maximum profit from waste products would be derived where pigs were grown at the rate of one pig to each dairy cow, or one to each ten acres of stubble in the grain districts. This program would about meet our own needs for pork, but would not produce an oversupply or demoralize the market.

General adoption of this program since 1916 has served to keep the hog industry on a steady and comparatively profitable basis. Prior to 1916, hog raising had been conducted in a hit-or-miss fashion. Sometimes there were too few hogs; sometimes too many. The year of 1915 was particularly disastrous, with supply of hogs far in excess of feed supply and of our market demands. The same influences which produced the disaster of 1915 have been operative at various times since that date, but presentation of the facts has prevented further difficulty.

This production program was perhaps the first attempt to correlate the resources of the state, the possibilities of the industry, and the demands of the consumer. This was not only the first production program for hogs in Oregon, but it was the first for any agricultural industry in Oregon or elsewhere, so far as we have been able to learn. It was from this germ, perhaps, that there developed the present comprehensive agricultural program for Oregon.

**Beef cattle.** The program for beef cattle and sheep was similar in principle. It was not begun, however, until 1913, and not until the last few years were there enough data accumulated to establish permanent policies which could be defended upon all occasions.

Years of results from experiments at the Union and Corvallis stations have shown, for example, in fattening cattle for market: that beef steers can be fattened more efficiently and more economically on hay and silage than on hay alone; that grain can be used only when the price is as low as three times the price of hay; that steers can be made ready to market at two and one-half years of age at the minimum expense and without the use of grain; but that steers younger than this can be produced only by the use of grain, which is not available. Comprehensive experiments also have shown that stock cattle can be wintered efficiently and economically on straw with a small quantity of protein supplement, but that, on the other hand, the use of silage for stock cattle increases the cost without increasing the returns. The data from these experiments coupled with survey work of production on ranches have given quite complete data on the cost of production which not merely show the present financial status of the business but which may be used as the basis of a budget for future operations. The results are given in Station Bulletin 220.

**Sheep.** Station work with sheep has paralleled that with cattle, with perhaps less emphasis on winter feeding and more on pastures and pas-

ture-carrying capacity. The results have shown that lambs can be fattened most efficiently on a simple home-grown ration of barley and alfalfa; that they can not be fattened on alfalfa alone, but they can be held on alfalfa for late winter market providing grain feeding begins at about seventy-five days before the time when it is expected to market them. In case of Western Oregon sheep, experiments have shown that native pastures are the cheapest and most satisfactory source of feed, but that fat lambs can not be produced on these pastures unless given a finishing period of at least thirty days on rape or clover. The cost of production studies made with cattle have been duplicated with sheep. The results are given in Station Bulletin 219.

The present data are far from complete, and changes in conditions will bring new problems. We believe, however, that sufficient is known to prevent disaster and to insure a reasonable degree of success. At least, many of the mistakes of the past twenty-five years can now be avoided as, for example, the overstocking of 1908 and 1909 and again of 1918 to 1921, or the unfortunate investments that were made in silos during the war. Further, it is believed that enough data are now available to warrant consideration and perhaps adoption of the budget system by stockmen.

This suggestion will be presented at the meeting of the Oregon Wool Growers' Association in January, 1927.

In fairness it should be stated that during the past twenty-five years, the stockmen themselves have given a great deal of thought and study to their own problems and the Experiment Station can not rightly claim credit for all of the information now available. The Experiment Station, as the stockmen's agent, however, has been the leader and as such is responsible for the major part of the data.

Some apparent duplication may be noted between this report of experimental work and the report of extension activities. This is only as it should be, since the research work should be followed by extension for completion of a program.

#### ADDITIONAL INVESTIGATIONS REQUESTED BY STOCKMEN

With 45 million acres in the state which will probably be continued in use for grazing, the range livestock industry must always be one of the important agricultural pursuits of Oregon. The range lands of Oregon, including the half million acres of hay land used for producing hay for the range livestock, have an appraised value of about 150 million dollars. The sheep industry uses a large part of this and is probably one of our soundest agricultural enterprises. Oregon sheep, numbering more than two million, have a present value of nearly 25 million dollars and a present annual production of from 12 to 15 million dollars. Nearly 90 percent of these sheep are in the range country.

The Eastern Oregon sheep owners are suffering considerable losses from a peculiar stiffness of lambs. Since no statistical studies of this trouble have been made it is impossible to give accurate data covering losses from this trouble. But many owners have reported that this frequently attacks from 5 to 20 percent of the lambs in given bands. Be-



sides the many requests which have come from individual sheepmen the officers of the Oregon Wool Growers' Association asked last year that the Experiment Station begin an investigational study of this problem.

In Western Oregon parasitic diseases are the most serious of our sheep disturbances. Our best livestock people believe that the quarter million sheep west of the Cascades could be increased by 25 percent to 40 percent if parasitic troubles could be controlled. During the fall and winter months scarcely a day passes without an inquiry to the Station concerning methods of treating and controlling one or another of these parasitic diseases. Specimens are brought or sent to the laboratory from practically every county in Western Oregon. Large numbers of sheepmen have asked that the Station begin studies of these troubles.

## SOILS, IRRIGATION, AND DRAINAGE

Soil, in conjunction with climate, forms the basis of agriculture. Choice of crops, rotation of crops, preparation of the ground, amount and method of irrigation and drainage, and the use of fertilizers, all vary according to the kind of soil. For a state so diverse in soils, climate, and agricultural industries as Oregon, a knowledge of the soil resources, followed by reliable data on fertilizers necessary for economical production, reliable data on use of water, on need and methods of drainage, and culture to maintain desirable texture, is accumulated only through years of continuous effort, experimentation, research and field trials.

The Experiment Station has been at work on such a program in varying degree from its beginning. Not until a small appropriation was begun by the State Legislature in 1919, however, was the work of any magnitude. In the past few years the accumulated results are assuming form of first value in agricultural development.

## ACCUMULATED RESULTS NOTABLE

**Soil surveys.** In cooperation with the Federal Bureau of Soils, a detailed soil survey of the Willamette Valley was started in 1917. A few weeks' work in Marion county will complete the field work for this survey covering 5,939,323 acres—all of the Valley outside the national forests. Josephine county was surveyed in 1919; a survey in the Grande Ronde Valley and one of the Ochoco project in 1926 covered 250,000 additional acres, making a grand total of 6,818,233 acres, mapped, and most of it covered by published reports and maps since 1917.

These surveys have made available a comparative classification of soils by types with the location, acreage, depth, character, and topography of each parcel of each type. These facts increase in value as more facts are available on soil, fertility, irrigation, drainage, and climatic requirements of different crops. With crop requirements known, the possible success of given field crops, fruits, or vegetables, in any given section and the area suitable for such industries, can be calculated with some certainty. Valuable suggestions for planting, care, and management can also be given. Such soil surveys are becoming indispensable in any organized program of reclamation and agricultural development.



**Soil fertility investigations.** Coincident with the soil surveys, a program of fertilizer trials, laboratory experiments by the soil workers, the chemists, and the bacteriologists is being developed, limited in extent, but producing results of value. A few examples will serve for illustration of value.

**Sulfur for alfalfa.** The Oregon Station was perhaps the first to discover the value of sulfur as a fertilizer for alfalfa—a discovery of far-reaching economic value. On alfalfa in Southern and Eastern Oregon, \$1.00 an acre a year for sulfur gives an average increase of about one ton in yield of hay. This treatment is now used on about 30,000 acres of alfalfa in the state. The gain in hay is about 30,000 tons annually having a net increase in value of \$180,000 or more, with possibilities three times this amount. The result is now a demonstrated fact. About 100,000 acres of alfalfa in the state will respond to this treatment.

**Lime.** For years farmers in the Coast section produced clover for a few years and then the crop failed. The results of 1926, following several years' experiments, fully demonstrate that by use of lime and manure good crops of clover can be continued in proper rotation. This, with successful introduction of vetches and field peas, assures the necessary legume crops indispensable to a thriving dairy industry.

Extensive areas of red-hill soils of Willamette Valley, which formerly produced good crops of grain and red clover, reached a point where wheat yields were only 10 to 12 bushels an acre and red clover was a failure. By the use of two tons of ground limestone an acre, red clover growing is again made possible and the foundation laid for more extensive types of farming with higher yields.

**Phosphates.** Experiments have shown that applications of phosphate fertilizers in combination with manure on worn-out grain land of the Willamette Valley will increase yield of small grains 4 to 7 bushels an acre, corn ensilage 1 to 2 tons, and profitable increases in potatoes on the more fertile red-hill soils of the Valley.

**Crop rotations.** Crop rotations, which have been in operation for years, now show marked results. Barley in rotation of grain-clover-clover-corn yielded 18.5 bushels an acre more in the ninth year than barley on adjoining land grown continuously; beans rotated gave an average gain of \$14.09 an acre over beans grown continuously.

**Barnyard manure.** Experiments show that losses of soluble plant food from barnyard manure in humid sections of the state can be reduced one-half by protecting this fertilizer from leaching by the winter rains. This is especially important on the many dairy farms of Western Oregon where this fertilizer is available and so valuable to successful cropping.

Similar valuable data have been secured as a guide to the profitable use of fertilizers for orchards, especially in Southern Oregon and Hood River Valley. The station data on fertilizers and cover crops have changed orchard practice much for the better in these sections.

**Irrigation.** Studies on the value of supplemental irrigation in the Willamette Valley have been under way for 18 years. Potato yields have been increased an average of 63.3 bushels an acre over 18 years; beets 5 tons an acre; beans 5 bushels; corn and kale 3 tons; late cuttings of

legume hay have increased the season's total about 2 tons. An average net depth of 6 inches of irrigation has given these results with a net profit of \$2.83 per acre inch for the 18 years.

Soil and feasibility surveys indicate that about 500,000 acres of Willamette Valley lands should have supplemental irrigation, as judged by soil conditions, availability of water, and crop increases secured. Each year there is more interest, more development, and consequently more need for these and further data on irrigation in the Willamette Valley.

**The use of water.** The amount and method of applying irrigation water for different soils and different crops for most economical results, all facts considered, varies greatly. Over-irrigation may reduce crop yields and decrease the producing power of the land; the method of irrigation successful on one soil may be wasteful, costly, and ineffective on another.

Studies on the sandy lands of the Umatilla Project have developed methods which have reduced the water use about one-half without reducing crop yields; investigations during 1925 and 1926 on granitic and adobe soils of Southern Oregon indicate much need and possibility of attention to economic methods of using water, especially where water is a limiting factor in use on intensive crops such as orchards. Economic use of water has been studied in the leading irrigation sections of the state. The data have been made available in Station publications. Though not as complete as the future will call for, the information is invaluable in the development of agriculture under irrigation.

**Feasibility surveys.** During the past two years the Station Staff has been called upon to assist with economic agricultural and soil surveys of irrigation districts in difficulty and of government reclamation projects. Recommendations of the Station have not always been observed relative to eliminations. More and more, such assistance, based upon the results of previous research on soils, irrigation, crops, and cropping systems, and agricultural enterprises will be needed in the development of irrigation agriculture.

**Drainage.** The Experiment Station has developed successful methods for tiling "white" lands which represent the most important drainage problem in the state; developed successful methods of reclamation and improvement for tide and overflow lands on the lower Columbia and along the Oregon coast; determined practical means of improvement and economic irrigation for wild meadow and tule lands of south central Oregon; and is making progress on the problems of drainage and utilization of alkali land, with work centered at Vale Experiment Field. Assistance has been given in feasibility, economic, agricultural, and soil surveys of many drainage projects. Preliminary drainage survey made of Willamette Valley shows that one-fourth million acres need community or district outlet ditches, which will cost \$10 an acre, and that one and one-fourth million acres need tile.

## FURTHER RESEARCH AND EXPERIMENTATION NEEDED

Soil fertility investigations might profitably be expanded and strengthened to include more field trials with fertilizers and more laboratory and greenhouse studies. Special attention should be given to soil fertility problems on fruits, berries, and truck crops in the Willamette Valley. Oregon's fertilizer bill is increasing. Much of it is necessarily wasted through using combination fertilizers because reliable information is not available to show the individual fertilizer elements needed.

Investigation of reclaiming alkali land should be strengthened. A large acreage of expensive development is subject to deterioration from this cause. Methods of reclamation have not been developed. The problem is complex and difficult of economic solution.

Water costs are high and water is a limiting factor in production in many sections. Too little attention has been paid to economical methods of using irrigation water. The problem is one of individual soil type. There should be more research, especially where water is used on expensive crops. Returns from proper use are large; mistakes expensive and not always known.

Pumping for irrigation is increasing in the Willamette Valley and will probably develop more rapidly. There is need for study of water supply, methods of development and equipment, as well as for further reliable data on water requirements and the economics of irrigating, especially berries, tree fruits, and truck crops. Pumping is expensive. One way to avoid mistakes is to anticipate them by reliable facts from properly conducted research and field trials. Research properly should serve this function, and to a less extent as a cure.

## AGRICULTURAL ENGINEERING

Work in Agricultural Engineering has been necessary for years in connection with Station investigations. In 1924 organized investigations were undertaken in cooperation with the "Oregon Committee on Relation of Electricity to Agriculture."

This Oregon Committee was organized in May 1924. It is composed largely of farmers, representatives of electrical equipment companies, power companies, farm equipment companies, the general public, the College department of Electrical Engineering, and the Agricultural Experiment Station. Its purpose is to obtain facts through research and experimentation concerning the use of electricity on the farm and to disseminate these facts. The task of conducting the investigation was delegated to the Oregon Experiment Station, and the Station Director was made chairman of the Committee.

**Survey made.** A survey of 188 farms located along eight power lines in as many different agricultural sections of the state was made during the summer of 1924. Following are a few of the outstanding facts resulting from the study. (1) Electricity was used on farms chiefly for lighting. (2) Little use was made of electricity for revenue-producing operations, and little thought had been given to such use. (3) Cost rates for electric service were much lower to those farms using electricity extensively than to those using it for lighting only. (4) Twenty-six



percent of the farmers along the lines studied were not using electricity because of inability to finance such use. (5) Few rural lines were profitable to the public service companies.

**Investigations since June, 1925.** Four major projects and a number of minor ones were handled during this period.

Irrigation studies on fourteen farms in Western Oregon showed profits over cost of irrigation and in some cases a good crop in contrast with no crop without irrigation.

Thirty-seven tests have been run on prune driers of many types. Motor-driven fans recirculating part of the heated air have increased the capacity of driers from 50 to 100 percent, improved the quality of the dried fruit, and lessened the drying cost. Tests of four hop driers indicated that the drying time can be reduced one-third by using fans to create forced draft. Tests of four walnut driers proved the need for forced draft to obtain rapid drying and maintain a high quality product.

Lighting laying houses during the months of October to April increased egg production of two pullet flocks and a flock of yearling hens. The project is being continued to determine the net gain for a full year. The influence of design upon heat distribution and ventilation in electric brooders was investigated in detail in the laboratory and the results checked by rearing chicks in the same brooders. Some machines were found to provide more uniform heat and better air movement than others. All of the machines tested were satisfactory for rearing good chicks when properly operated.

Tests were made on four types of feed grinders to determine the reliability, adaptability, and cost of operation of each. The project is being continued.

Other minor projects included farm studies of electric incubation, electric chopping of green feed, an electric oat sprouter, motor-driven apple graders, motor-driven ensilage cutters, electric hay hoists and grain elevators, shearing sheep by electricity, and motor-driven domestic water systems. Results of these studies are included in the 1926 Annual Report to the State Committee.

Investigations in this field are being expanded in cooperation with the specialists in the various agricultural enterprises and with branch stations. It is hoped that economic uses for power on the farm can be found so that farm home conveniences as well as power can be made available on the farm without creating additional overhead expense.

Investigations are financed largely by the Oregon Committee on the Relation of Electricity to Agriculture.

## HOME ECONOMICS

The Federal Purnell Act provided funds for investigations in the field of home economics and emphasized their desirability.

Beginning December 1, 1925, Miss Maud Wilson was employed to devote full time to development of work in this field in cooperation with the Resident Instruction and Extension Service staffs and the Federal Bureau of Home Economics.

Studies in home management were undertaken upon unanimous recommendation of the state workers in home economics. The aim is to



supply a picture of Oregon homes so far as their management is concerned—this to serve as a background for further work in research and teaching. By June 30, a total of 256 cooperators had been secured in eleven counties of the state. A total of 126 records have been returned. A summary was made of the first fifty records to be presented as part of a report before the American Home Economics Association at Minneapolis, June 30, 1926.

The work of Miss Wilson in this field has brought favorable comment from the national associations and Federal cooperators. Development of research in this field will be under recognized research methods on problems selected with care.

## GENERAL SERVICE

The Station Staff is called upon to render assistance in many ways aside from that reported under investigations. Service, through correspondence, field examinations, conferences with growers and groups of growers, laboratory tests and Station field days, lectures, and radio, no doubt ranks high in benefit to Oregon agriculture. Such service at times is a costly interruption to experimental work under way. On the other hand, the staff members are thus kept in close contact with the practical problems of the farmers and are better qualified to plan and carry out investigations with a clear objective.

As illustrations of the extent of service rendered, the department of Veterinary Medicine during the past biennium made more than 6,000 agglutination tests for infectious abortion, aside from those in connection with experimental work; approximately 2,000 laboratory diagnoses; about 1,400 office conferences with livestock owners; and about 150 visits to farms at the request of the farmers. Several thousand inquiries were answered by letter.

The department of bacteriology made approximately 700 tests of water for individual farms and communities. More than 750 tests of milk were made annually. Other tests of foods were made, many of which involved several letters following the analyses of samples in order to assist in correcting existing troubles.

All departments of the main Station at Corvallis and the seven Branch Stations are called upon for a similar amount of service in their respective fields.

The heavy correspondence, field assistance through the Extension Service, radio programs, and other services along similar lines are possible only through devotion and long hours of work on the part of staff members. Should demands along this line increase further, it will be necessary to make adjustments in order to protect the investigational work.

The Station data from research and experimentation were the foundation of the agricultural programs developed at the Agricultural Economic Conferences and Station Staff members have devoted a great deal of time to the preparation of the material and to the formulation of the programs in conference.

**Station field days.** Field days were continued at each of the stations. At the Central Station, Corvallis, a week of field days was held in 1926. Farmers from counties of the Willamette Valley came in groups under the leadership of their respective county agents. The entire Station Staff was available on these days to conduct the visitors over the Station work and direct attention to experiments and findings of particular value to farmers of the respective counties.

Similar field days were held annually at each Branch Station. In this way, many farmers have appreciated, as never before, the possibilities of the Experiment Station as a means of solving their problems and bringing to them the best crops and practices for their respective districts without expensive trials by the farmers individually. The field days are growing in popularity and effectiveness.

**Exhibits.** During each of the past four years the Experiment Station prepared an elaborate exhibit for the Oregon State Fair. A smaller exhibit was made each year at the Pacific International Livestock Show. The State Fair exhibit has involved all departments and most of the Branch Stations. It has required considerable expenditure of time on the part of Staff members and funds for travel and materials. The results have been rather carefully observed, and it is believed they have been worth while.

**Regulatory.** The Experiment Station Staff administers the state Fertilizer Inspection Law, the Lime Law, the Insecticide and Fungicide Law, the Dairy Bull Registration Law, and the Stallion Registration Law. Valuable service is rendered in this connection at comparatively small expense by using the background of Station facts and the trained Staff members when they are needed, without duplicating overhead expense.

**Publications.** Eighteen Station Bulletins and 20 Station Circulars were prepared and issued during the biennium ending June 30, 1926. The average edition of bulletins was approximately 5,000 copies, and of circulars 4,000.

In addition to the bulletins, circulars, and technical papers in journals, circulars of information were started during the last biennium. These bear a number and the Station headings just as the bulletins and circulars do. They are mimeographed. The purpose is to make available information not in other form for distribution. This plan aids in answering inquiries. It reduces letter writing and aids in promptness of reply when specialists on the given subjects are absent. In addition to these publications, hundreds of popular articles are prepared for journals and newspapers.

## NEEDS

**Greenhouses, land, and storage needed.** *Greenhouses.* The urgent need of greenhouse space was emphasized in the two reports of the Director covering the four years up to June 30, 1924. No additional space has yet been provided. The Station is still limited to one small section of greenhouse. It was expected that new houses, comprising part

of an adequate system to be constructed over a period of a few years, would be available before the end of the biennium. The buildings were again deferred due to lack of funds.

The most simple needs of Experiment Station workers with soils, crops, and plant diseases can not be met. The point has been reached where lack of greenhouse space is a limiting factor in important lines of work. It is a limiting factor also in securing certain Federal cooperation assigned to the Oregon Station to work on difficult problems of plant diseases and pests.

*Land.* The field work in Farm Crops and Soils Irrigation and Drainage is scattered about on several rented farms. The College farm has little land available suitable for plot experiments. The drainage field, which has been in operation for a number of years and growing more valuable each year, will probably be taken over for campus development within a year.

Obviously, successful Experiment Station work in these lines requires land in adequate quantity and of character suitable to represent the problems to be solved. Compared with the Branch Stations, the Central Station at Corvallis is limited in this respect and there is a corresponding limitation in the development of outstanding results.

A tract of 50 acres was rented for a period of 10 years in late 1925. This was for the purpose of conducting irrigation experiments on field crops and small fruits on river-bottom land suitable for this purpose, and for which water can be secured by pumping with a reasonable lift. The ten-year lease is the longest we have yet been able to obtain. Even this is not long enough. The results will be growing in value and the work will just be well established at the termination of the rental period.

Several hundred acres of land suitable for the experimental work of the Crops department and of the Soils department must be secured if we are to develop the Station work as it should be developed to meet the problems of Western Oregon.

The need of a satisfactory orchard site also has been discussed in the last two reports of the Director. There is no hope of bringing into bearing a commercial orchard, or of doing satisfactory experimental work on the orchard site now available. Already the Station is handicapped by being obliged to seek cooperation with orchardists having suitable land in order to carry on much of its orchard experimental work. The situation grows more serious each year.

*Seed house and storage house.* Storage facilities for the care of valuable seed stocks and for experimental work are still lacking. Space is needed for service by all departments.

The lack of cold storage facilities at the Home Station has made it necessary to conduct storage investigations with fruits at Medford and at Hood River, where adequate, properly equipped storage rooms have been provided by the fruit industry. This arrangement is excellent for investigations at these two points, but should be supplemented by similar facilities at the Home Station. These are necessary to check results and to make possible a greater quantity of work with less expense by minimizing travel.

**Equipment.** Expenditures for equipment for several years have been limited to purchases absolutely necessary for continuing the work. This policy has seemed wise because of the agricultural depression and the demand for Station assistance far in excess of Staff and facilities. A number of the departments are in need of equipment to replace present equipment and to meet the expanding needs. This is particularly true of the departments of Soils and Farm Crops.

The lysimeter tanks and weather equipment of the Soils department west of Cauthorn Hall may have to be moved because of campus expansion. Before this is done similar facilities should be provided elsewhere. This department and the Farm Crops department are both in need of additional laboratory equipment. The day of equipment emergencies is approaching, in fact, in most of the departments.

Respectfully submitted,

JAMES T. JARDINE,  
Director of the Experiment Station.



# REPORT OF THE EXTENSION SERVICE

To the President of the College,

Sir: With the close of the biennium 1924-26, the Extension Service completes approximately fifteen years of activity. While the present report is not a complete history of the Extension Service and its accomplishments, it is an outline of the scope of projects comprising this branch of the College, presenting typical accomplishments to show the application of extension work to the state's leading agricultural enterprises.

## PERSONNEL AND SCOPE OF PROJECTS

The following tabulation shows the growth of the Extension Service since its organization as a separate unit of the College, November 8, 1911.

Classification of personnel	Numbers as of December 1		
	1912	1916	1926
County workers:			
County agents .....	0	13	25
Assistant county agents .....	0	0	4
District county agents .....	0	0	1
County club agents .....	0	0	5
City club agents .....	0	0	1
Home demonstration agents .....	0	0	2
	<hr/>	<hr/>	<hr/>
Total county workers.....	0	13	38
Central staff:			
Director .....	1	1	1
Secretary .....	1	1	1
Editor of press bulletins .....	1	0	0
County agent leader .....	0	1	1
Assistant county agent leader .....	0	1	0
Boys' and girls' club leader .....	0	1	1
Home economics leader .....	0	1	1
Agricultural specialists .....	0	9	9½*
Home economics specialists .....	0	1	3
Information department (radio, slides, films, etc.) .....	0	0	2
	<hr/>	<hr/>	<hr/>
Total central staff .....	3	16	19½*
	<hr/>	<hr/>	<hr/>
Total number of workers .....	3	29	57½*

The first county agricultural agent in Oregon entered upon his duties in Marion county November 7, 1912. Passage of the Smith-Lever act by Congress in 1914 greatly stimulated the employment of county extension workers and as their number increased, demand for Extension work developed in proportion. Need for state-wide direction of subject-matter projects led to the employment of a staff of specialists, administratively responsible to the Director of the Extension Service and responsible to their respective department heads for the character of the subject-matter

\* Fraction indicates half time.

taught. The number of specialists has been practically stationary since 1916 because of lack of funds for further expansion in that direction.

The work of the Extension Service has for many years been conducted on a project basis. At the present time these projects are:

Publication of bulletins and circulars	Dairying
Radio, visual instruction, and exhibits	Poultry
County agent work	Farm crops
Home economics extension work	Farm management
Boys' and girls' club work	Agricultural economics
Soil fertility and reclamation	Agricultural engineering
Horticulture	Rodent control
Animal husbandry	

## TYPICAL RESULTS OF EXTENSION WORK

### DEVELOPMENT OF AGRICULTURAL PROGRAMS BASED ON STUDIES OF PRODUCTION AND POSSIBILITIES IN RELATION TO MARKETS

**Agricultural economic conference.** The Extension Service initiated the movement that resulted in the determination of state, county, and district agricultural programs, adopted after a study of local resources in relation to marketing possibilities. One state-wide agricultural conference, 17 county conferences, 1 district conference, and 1 commodity conference have been held since January 1, 1924.

Events leading up to these conferences, and the conferences themselves are listed chronologically:

(a) "An Outline of Agricultural Practices in the Willamette Valley," which resulted from a conference of Experiment Station and Extension workers in October, 1921.

(b) "Systems of Farming Adapted to Eastern Oregon Irrigated Section," which resulted from a conference of Experiment Station and Extension workers in October, 1922.

(c) Marketing conference of April 9, 10, and 11, 1923, called by the Extension Service for the purpose of planning a study of Oregon agriculture, commodity by commodity, with a view of considering problems from a production and marketing standpoint and coordinating production with market possibilities.

(d) Publication in October, 1923, of Extension Bulletin 367, by Paul V. Maris, Director, "An Agricultural Program for Oregon." This bulletin contains an analysis of facts for the purpose of determining (1) what crop, livestock, and fruit products can most profitably be grown and marketed in the state of Oregon, and (2) how the production of these commodities can best be distributed and organized to harmonize with natural conditions and facilitate marketing.

(e) The Oregon Agricultural Economic Conference, Corvallis, January 23 to 25, 1924. Participating in this conference were 540 delegates, of whom three-fifths were farmers. All parts of the state were represented, and all agencies interested in the development of Oregon agriculture. Members of the Extension Service Staff spent months in assembling and analyzing data for presentation at this conference. Experiment Station

workers gave material assistance in this preparation. Out of it came a 78-page printed report that constitutes the foundation of an agricultural program for the state.

(f) County economic conferences as follows:

Lane, at Eugene, February 13 to 15, 1924  
Jackson, at Medford, February 18 to 20, 1924  
Josephine, at Grants Pass, February 21 to 22, 1924  
Deschutes, at Redmond, February 26 to 27, 1924  
Crook, at Prineville, February 28 to 29, 1924  
Malheur, at Ontario, March 6 to 7, 1924  
Union, at La Grande and Union, March 7 to 8, 1924  
Polk, at Dallas, November 18 to 19, 1924  
Wasco, at The Dalles, December 2 to 3, 1924  
Hood River, at Hood River, December 4 to 5, 1924  
Benton, at Corvallis, January 13 to 14, 1925  
Multnomah, at Gresham, January 15 to 17, 1925  
Clackamas, at Oregon City, January 27 to 28, 1925  
Washington, at Hillsboro, January 28 to 29, 1925  
Coos, at Coquille, November 16 to 17, 1925  
Douglas, at Roseburg, November 19 to 20, 1925  
Columbia, at St. Helens, December 11 to 12, 1925.

The report of each conference except Douglas was published in bulletin form. In each case a county production and marketing program was developed, based upon a study of the state conference recommendations as applied to local conditions.

The Extension Service provided men to gather and analyze needed local data, under the direction of county agents. Specialists were furnished who advised with local growers in formulating reports.

(g) Wheat Growers Economic Conference, Moro, February 11 to 13, 1926. This was a conference to consider the economics of wheat production in Eastern Oregon. The resulting printed report has been termed the most comprehensive study of wheat production ever attempted in Oregon.

(h) Umatilla Project Economic Conference, Hermiston, February 15 to 16, 1926. This conference was the first to study an entire reclamation project as a unit. It covered portions of Umatilla and Morrow counties. The printed report is recognized as an authoritative guide for the most profitable types of farm enterprises under conditions prevailing on the project.

**Definite progress already manifest.** The economic conference recommendations embody the united judgment and experience of college workers, farmers, bankers, and others associated with agriculture in the districts concerned. All available government reports and data were utilized, as well as College Experiment Station findings and local information pertaining to the studies made. The resulting programs have served to coordinate the efforts of all agencies essential to agricultural development. They are the foundation upon which the program of the Extension Service is built.

Definite progress as a result of the economic conferences can already be measured. Following examples are typical:



"In the Rogue River Valley, in line with the recommendations of the county economic conferences held there, 1,000 acres of unprofitable apple orchards were removed this year. Most of this land has been placed in alfalfa for a period, but it is estimated that 50 percent of it will be turned to orchard. The new plantings will be late pears of marketable varieties."—From reports of county agents.

The Washington county conference recommended that the county's alfalfa acreage be materially increased in order to supplement a hitherto inadequate supply of legume hay for dairy cattle and to provide an ideal summer green feed crop for poultry. The status of alfalfa growing in that county is shown in the 1926 report of the county agent.

Year	Farms on which	
	planted	Acres planted
1923 .....	36	55
1924 .....	121	220
1925 .....	262	521
1926 .....	407	1200

It is estimated that 2,000 acres will be planted in 1927.

The Josephine county conference found that strawberries of the finest quality could be grown there and placed on the early markets. It was recommended "that the acreage of strawberries be so increased that there will be a sufficient supply for carlot shipments." Recommended varieties, grade specifications, and other details essential to a successful enterprise were set forth and the necessity of forming an association of growers was emphasized. These plans were followed out and in the season of 1926 approximately 100 acres of strawberries were harvested and marketed by an association of growers. Another 250 acres was planted that season.

The report of the Umatilla project conference was favorably commented upon by Dr. Elwood Mead, commissioner of reclamation in the United States Department of the Interior. He said:

"This report comprises the record of proceedings of a very splendid movement, particularly affecting one of our struggling projects, and from it I gather that you have spread this missionary work over the entire state. I am particularly impressed with the system of organization and conduct of these conferences, whereby you utilize all the latent energies and talent of these communities, and judging from the results on the Umatilla project you have unearthed a surprising amount of sound reasoning and resulting conclusions.

"The report of the committee on project economics is especially striking and suggests a number of ways out of present difficulties along practical lines."

**Farmers have noted the effects of the conferences.** A letter from W. G. Rodda, Hermiston, comments on the Umatilla project conference in this wise:

"Having lived here since 1908 (4½ miles southeast of town), I notice a change in things since the economic conference of February last. The farmer is seeing his way out of the old rut since then. The many facts brought out at that time are of great help and they seem to be on the increase. While at the Oregon State Beekeepers Convention at Dallas, I was asked what is an economic conference. I replied by saying, 'Hidden facts brought to light'."



Commenting on the Wasco county conference are other typical expressions of approval of the economic studies:

"With reference to the agricultural economic conference recently held in Wasco county, my personal opinion of this is that it was one of the most constructive three-days labor that has been performed by any of the organizations in Wasco county."—L. Barnum, The Dalles.

"The information gathered at such a conference from actual producers can indicate but two things, first, What is best to produce from the standpoint of local conditions and market demands; and, second, what is best to discontinue producing. The findings of the conference are very valuable to this district if we make use of them."—T. A. Sammis, Jr., The Dalles.

Influence of the state economic conference is felt in many directions. For instance, the Morning Oregonian in an editorial on December 12, 1926, discusses the poultry industry in Oregon. The opening paragraph is as follows:

"The answer to a correspondent who wants to know whether it is advisable to expand the poultry industry in Oregon is necessarily conditioned by the personal factors involved. The situation as to poultry on a whole, the outlook for future markets, and the possibility of profits were carefully reviewed at the initial agricultural economic conference held some time ago at Oregon Agricultural College, and while nothing has occurred to alter the main conclusions there presented, the fact remains that no satisfactory solution of the problem can be found for all men."

The editorial then goes on to discuss the poultry situation, making frequent reference to the state conference poultry report.

## BOYS' AND GIRLS' CLUB WORK

**Training in agriculture and home economics.** Thousands of Oregon boys and girls each year receive systematic instruction in agricultural and home economics subjects through the projects represented in boys' and girls' club work. Not only are members taught improved methods, practices, varieties, etc., but they are also given valuable experience in organization and leadership. Each club has its president, vice-president, and secretary. Regular meetings are held. Demonstrations and exhibits are other features of the club program.

Each year a club summer school is held on the College campus, with a steadily growing attendance. In 1926, approximately 500 members were present.

Encampments are also held each year at the State Fair and Pacific International Livestock exposition.

Exhibits by club members have become an important feature of community, county, and state fairs. In competition with adults, club members have taken many prizes. At the 1922 State Fair, the first class of hogs judged consisted of 42 Poland China gilts representing the best blood in Oregon, California, Washington, and Idaho. Club members took first, second, third, and fourth ribbons.

Club work was organized in 1914 with 10 projects. Probably the best indication of sound growth of this work is the steadily mounting percentage of members who have completed their work.

Year	Percentage of members who completed all work for which enrolled
1914	2
1915	4
1916	8
1917	16
1918	25
1919	33
1920	42
1921	52
1922	64
1923	68.9
1924	75.6
1925	80.1

Enrollment figures since 1920 show the magnitude of club work.

Year	No. of clubs	Enrollment	—Completed—		Value of products	Profits
			Total No.	Percentage		
1920	610	5,115	2,929	42.0	\$111,584	\$55,942
1921	724	6,487	4,189	52.0	127,359	66,778
1922	854	6,579	4,257	64.0	134,046	56,537
1923	742	5,777	3,971	68.9	120,940	45,166
1924	725	6,047	4,572	75.6	140,113	49,831
1925	912	7,583	6,081	80.1	162,601	58,195

Practices that have been given to club members in their instructions have often led to the adoption of similar practices by parents. The first pure-bred animals on many farms in Oregon have been placed there by sons or daughters enrolled in livestock club projects.

**Outstanding counties have club agents.** Seven counties in the state now have full-time county club agents, namely: Klamath, Jackson, Douglas, Lane, Clackamas, Multnomah, and Tillamook. A full-time club leader is also employed in the city of Portland. The few counties with the services of a full-time club agent have accomplished more work than all others combined.

Year	No. of club agents	—Total enrollment—		Total number completing counties with club agents	All other counties
		Counties with club agents	All other counties		
1923	7	2,426	3,351	2,132	1,839
1924	7	3,772	2,275	3,063	1,509
1925	7	3,714	4,869	3,286	2,795

## HOME ECONOMICS EXTENSION WORK

**Thousands of women assisted.** Demand for this type of Extension work is greater than can be furnished with the available staff of specialists. Clothing, food and nutrition, and household management are the most popular phases of home economics extension. In the five years a clothing specialist has been employed, 8,000 women in 450 communities of 21 counties have been assisted. Present demands for this work are four times as many as can be met.

**Results are cumulative.** Typical of the food and nutrition project is this report from one county:

Fifty-five women who are enrolled in the nutrition project in three communities report as follows:

36 eat more uncooked vegetables	36 use more milk
14 eat more whole grain breads and cereals	8 corrected constipation
47 eat less sugar and sweet foods	9 overweights lose
45 plan and prepare better every-day meals	2 underweights gain

During 1925, a total of 1,139 families report the adoption of better nutrition practices recommended by Extension agents.

Last year, different women attending organized project meetings in home economics subjects conducted by home demonstration agents, state leader, and specialists totaled 11,744 in 134 different communities, with 3,619 homes actually reporting the adoption of the practices recommended. These figures do not include contacts made at 141 other home economics meetings such as Homemakers' Institutes, Farmers' Weeks, Extension Schools, etc., with an attendance of 8,070.

### THE WORK OF COUNTY AGENTS AND AGRICULTURAL SPECIALISTS

Since 1911, when organized Extension work in Oregon was begun, the "on-the-farm-demonstration" of practices proved by findings of the College and federal experiment stations has been the keystone of activities of Extension field workers. Outstanding accomplishments in several fields are listed herewith. These are the fruits of the combined efforts of county agents and the respective Extension specialists.

(a) **Animal husbandry.** In Oregon there are over 500,000 beef cattle, 2 million sheep, 200,000 swine, 140,000 goats, and 275,000 horses and mules. The total income annually from livestock in Oregon, aside from dairy, amounts to about \$36,000,000, or 28 percent of the state's total agricultural income.

Typical of the animal husbandry project is the fleece improvement achieved in the flock of Ned Sherlock, Lake county. Four years' weights have been taken, beginning in 1923. The number of sheep in the flock has run from 1,500 to 1,800. The culling standard has been 7 and 8 pounds, beginning with 7 pounds and increasing to 8 pounds the third year. The first year there were 241 head that sheared below the standard of 7 pounds. These were disposed of before the next shearing time. The percentage shearing low has decreased each year. The total number of sheep shearing above 10 pounds the first year was 180, and at the fourth year's weighing there were 771 in this class. The size of the lamb crop has been maintained at approximately 100 percent.

In 1923 the average fleece weight in Mr. Sherlock's flock was 8.3 pounds. In 1926 it was 9.77 pounds.

(b) **Agricultural engineering.** Through this project the Extension Service has directed the distribution in Oregon of surplus war explosives provided at cost by the United States Department of Agriculture. From November 1, 1923, to December 1, 1926, a total of 4,148,350 pounds of these explosives was distributed to 11,256 farmers. The same quantity of explosives if purchased at current market prices would have cost \$474,188



more than was paid for that furnished by the government. In addition, \$16,500 worth of caps were distributed free.

These explosives have been principally used to extend and straighten boundaries of cultivated fields, to remove old stumps from the middle of fields, and for clearing land which was valuable for intensive cultivation because of its location. If the lands so cleared were all in stumps and had 30 stumps to the acre, requiring 3 pounds of explosives for each stump, the total amount of explosives distributed would clear 46,000 acres.

(c) **Agricultural economics and marketing.** The Extension Service has furnished material assistance in the organization of practically every important agricultural, cooperative marketing association in Oregon during the last ten years. The Oregon Cooperative Council, composed of representatives from cooperative associations and other groups interested in agricultural development, was formed on the initiative of the Extension Service. Typical examples of this activity are:

*Pacific Cooperative Wool Growers.*

Initiated by the Extension Service. In the 6 years of its existence this association has handled wool worth more than \$9,000,000.

*Pacific Cooperative Poultry Producers.*

Plans were furnished by the Extension Service for the original association out of which the present organization has grown. This association now markets most of the eggs produced on a commercial basis in Oregon.

*North Pacific Cooperative Prune Association.*

Organization plans furnished by the Extension Service. This association has been in operation for three years. It handles one-half of the dried prunes of the Northwest. Packing costs have been reduced from  $2\frac{1}{2}$  cents a pound to  $\frac{3}{4}$  cent. At the same time, quality of the pack has been improved.

Organization of marketing associations alone does not reach the fundamental causes for low prices and unbalanced agriculture. To assist Oregon farmers in planning their enterprises wisely and with full knowledge of the situation in other states, the United States, and the world, the department of Economics of the Extension Service has recently undertaken to prepare and issue "The Agricultural Situation," a monthly publication that reviews current economies, statistical and market information. Federal data and information supplied by county agents and College departments are utilized in this summary. This, with the annual "Agricultural Outlook" which is also compiled by the department of Economics of the Extension Service, is intended to furnish the farmer information that, if correctly interpreted, may permit him to plan his farm enterprises so as to produce only those commodities for which the market outlook is favorable.

(d) **Dairying.** In the decade 1910-1920, Oregon became an exporter of dairy products. In 1919, income from dairying was approximately \$16,000,000. The industry is increasing at the rate of about 5 percent each year. Marketing a surplus of dairy products has become a pressing problem. The questions of economical production and the manufacture of



high quality products are of paramount importance in dealing with that problem.

The dairy project of the Extension Service has been conducted largely along the following lines:

Better sires campaigns.

Organization and development of cow testing associations.

Eradication of bovine tuberculosis.

Educational work on feeding and production of quality products.

*Better sires campaigns.* In 1917, it was estimated that of all the dairy sires used in Oregon, only 20 percent were pure bred. By 1920, 48 percent of the dairy sires were pure bred, according to census figures. Records obtained in some counties show that the percentage is less than that. Inasmuch as production per cow is one of the most important factors in economical production, and since the breeding of dairy cows determines to a large extent their productive ability, pure-bred sire campaigns have been stressed. County agents are in charge of organizing these campaigns in their respective counties.

In the year 1924, Columbia and Clackamas counties undertook this type of campaign. A total of 71 pure bred sires were sold in those counties, replacing 107 scrubs. In 1925, 29 pure bred sires were brought into Josephine county by this means, and 50 percent of the scrub dairy sires in that county were eliminated.

Crook county, by the end of the year 1925, after several years of continuous effort had eliminated every scrub dairy sire.

Reports by county agents show that in the years 1919 to 1925 inclusive a total of 835 pure-bred sires were placed on the dairy farms of the state through their efforts.

*Cow testing associations.* Census reports indicate that the average annual production per cow in Oregon is about 168 pounds of butter-fat. Cost of production studies made by the Extension Service and the Experiment Station indicate that at least 240 pounds of fat on the average is necessary to insure profitable returns. By means of systematic testing of cows for butter-fat production the productive ability of individual cows can be detected and low producers eliminated, thereby building up the herd average.

Cow testing associations have been organized by the Extension Service since 1912. During the year 1925, 367 herds were represented in these organizations, with 6,443 cows on test. A total of 286 cows were discarded as a result of test findings.

The experience of the Tillamook county cow testing association is evidence of the value of this Extension activity. It was organized in 1912 and has been in continuous operation since then. The 1920 United States census credited that county with an average butter-fat production of 244 pounds, as compared with a state average of 168 pounds. The cows in the testing association in the year 1919-20 averaged 286 pounds of fat in production. In 1925-26 this association averaged 364 pounds of fat.

Typical of the consistent increase in herd production resulting from cow testing, use of pure-bred sires, and good management, are the results

from two Tillamook county herds that have been members of the cow testing association for many years.

Name	Year	Number of cows in herd	Average fat production per cow—pounds
Dave Fitzpatrick .....	1917-18	23	289
	1921-22	27	382
	1923-24	19	421.8
	1925-26	21	471.02
W. B. Vaughn .....	1917-18	17	258
	1919-20	19	291.7
	1923-24	20	381.6
	1924-25	16	402.43

Mr. Fitzpatrick has been a member of the cow testing association since its organization. He has always used a pure-bred sire with his herd. For the past seven years Mr. Vaughn has also used a pure-bred sire.

*Bovine tuberculosis eradication.* Systematic testing of dairy cows for tuberculosis and disposal of reactors was first undertaken in 1920, with the cooperation of the Bureau of Animal Industry of the United States Department of Agriculture and Oregon State Veterinarian. The results of this project are as follows:

Year	Cows tested	Reactors disposed of
1920 .....	10,359	251
1921 .....	42,346	361
1922 .....	47,112	669
1923 .....	48,393	693
1924 .....	43,113	576
1925 .....	27,997	108
	219,320	2,658

Percentage of reactors .012. This is very low by comparison with other dairy states.

(e) **Horticulture.** Income from the sale of Oregon fruits, nuts, and vegetables is in the neighborhood of \$20,000,000 annually. Horticultural Extension work has been centered around projects to serve that big industry. The outstanding accomplishment in this field has been the establishment of long-time horticultural development programs in fourteen counties of the state, representing the principal fruit producing areas, to wit: Malheur, Union, Umatilla, Wasco, Hood River, Multnomah, Washington, Clackamas, Polk, Benton, Lane, Douglas, Jackson, and Josephine. These long-time programs have as their basis the aim to balance production with marketing possibilities.

Horticultural management problems have been given attention as follows:

*Pruning.* The College Experiment Station worked out the principles on which the modern "thinning out" or long system pruning method is based. During the past six years this system of pruning has been demonstrated by county agents and the horticultural specialist as opposed to the more severe method of heading back theretofore used. The advantages of the "thinning out" method are: quality, especially color, is improved; the yield is increased because of greater bearing surface.

From 75 to 100 percent of the pruning done on the commercial fruit acreage of the state is now of the "long" type.

One orchard in four years increased its production from less than 8,000 boxes of apples to 14,000 boxes by following this system of pruning. One Willamette Valley grower in 1926 took from five-year-old "long"

pruned Italian prune trees an average of 150 pounds of green prunes, while headed-back trees averaged only 40 pounds. The year before, this orchard had produced an average of 30 pounds of fruit on long pruned trees, while headed-back trees produced only 7 pounds on the average. The packing plant to which this grower took his product declared that the quality of his fruit was the best it handled. Out of 650,000 pounds of other growers' fruit received, this plant secured 2,600 pounds of 30-40's. The grower in question had 4,000 pounds of 30-40's out of his crop of 25,000 pounds.

*Orchard soil management.* Until recent years, clean cultivation has prevailed in most of the state's commercial orchards. This gradually depleted the organic content of the soil, thereby injuring the physical condition, reducing the water capacity, and decreasing productivity.

The Extension Service sponsored a campaign to increase the acreage of cover crops in these orchards. In Lane county, after three years work along this line, a 1200 percent increase in the cover crop acreage was noted. In Washington county, a 900 percent increase followed demonstrations arranged by the county agent and horticultural specialist. Other counties of the state have shown similar increases.

Willamette Valley orchardists are using bulky organic materials, such as hay and straw, heretofore burned or otherwise disposed of. On the OACO Orchards at Monroe, the largest apple orchard in the Willamette Valley, many tons of straw are annually applied to the soil. The Skyline Orchards in Marion county, one of the largest nut orchards in the state, use about 200 tons of grain and vetch straw annually, in addition to cover crops.

Many large Rogue River pear orchards have adjoining alfalfa acreage so that they may be assured of hay to place on their orchards. The cost of raising a ton of alfalfa is about \$8.00. Each ton is worth approximately \$20.00 because of the nitrogen and organic matter it contains.

Cover crops and addition of organic matter improve the physical condition of orchard soil, and trees become more productive and vigorous. The Skyline Orchard, in Marion county, in 1926 produced the largest walnut crop in its history, despite the fact that that year was one of the driest on record. The nuts were of good size and quality. According to the manager of the orchard, this was almost entirely due to soil management practices put into effect during the last three or four years.

(f) **Farm crops.** Cereals, forage crops, and potatoes return approximately 40 percent of the state's agricultural income, or in round numbers approximately \$50,000,000 annually.

Owing to the economic importance of farm crops production in the state and its close relationship to livestock and dairy production, the farm crops project has been recognized by the Extension Service as one of fundamental importance.

The major farm crops projects have been as follows:

- Grain standardization and seed improvement.
- Potato standardization and seed improvement.
- Copper carbonate for wheat smut.
- Forage crop improvement, including Grimm alfalfa, pasture grasses, vetch for hay in the coast counties.
- Development of seed crops.



*Grain standardization and seed improvement.* Oregon grows commercially 64 varieties of wheat, 18 varieties of barley, and 23 varieties of oats. It is desirable to reduce these many varieties to a few that have been tested and are known to be sufficient for all conditions found in the state.

The College Experiment Station has found that about 12 specified wheat varieties are especially desirable.

With these recommendations as a foundation upon which to work, county agents arranged on-the-farm demonstrations to show the worth of these best varieties. Increase in acreage of Federation and Hard Federation wheats is but one of several examples of the effectiveness of this demonstration program, with which were associated field tours of inspection, winter meetings, and news articles.

The table below is self-explanatory:

EXPANSION OF FEDERATION WHEAT ACREAGE

Year	Acres seeded	Number of demonstrations	Number of counties
1920.....	0	0	0
1921.....	33	2	2
1922.....	520	22	4
1923.....	12,198	134	5
1924.....	53,200	28	10
1925.....	171,400	81	18

What is true of Federation wheat is equally true of Hard Federation, the former being the recommended spring wheat on the irrigated and more moist lands of Eastern Oregon, and the latter best for the drier sections. The increase in Hard Federation acreage is illustrated in the following table:

EXPANSION OF HARD FEDERATION WHEAT ACREAGE

Year	Acres seeded	Number of demonstrations	Number of counties
1920.....	0	0	0
1921.....	194	12	4
1922.....	1,167	44	6
1923.....	9,115	101	9
1924.....	35,210	11	13
1925.....	172,250	18	13

Expansion of recommended barley and oats varieties has been accomplished in like manner.

The economic value of the availability and distribution of Federation wheat in the crisis of 1924-25, when frost destroyed the fall-sown wheat on more than one-half a million acres of wheat land in Eastern Oregon, this land later being reseeded to Federation, has been explained in the report of the Experiment Station and hence need not be repeated here.

*Copper carbonate for wheat smut.* The rapid spread of the use of copper carbonate in treating wheat for smut control as a substitute for the previously accepted formaldehyde treatment is another typical illustration of on-the-farm demonstration activities.

Oregon normally seeds about 1,100,000 acres of wheat. Formerly this was all treated with either bluestone or formaldehyde, and an average of at least 20 percent of the seed was killed. On the basis of a bushel seeded to an acre, an annual loss of 202,000 bushels was thereby



sustained. The above treatment not only reduced stands of wheat, but occasionally the entire lot of seed was killed outright. In most instances the vigor of the plant was reduced. Growth was held back by these treatments, giving weeds a chance to start.

Substitution of copper carbonate for formaldehyde and bluestone would overcome all those disadvantages, according to experimental data.

In the year 1921, 88 demonstrations of this new method of treatment were arranged by county agents, covering 125 acres of wheat. By the year 1925, the establishment of the copper carbonate treatment was completed in Eastern Oregon. It is estimated that in 1925 alone savings in seed wheat amounted to over \$300,000 and that another \$1,000,000 was added through better crops and time saved in handling the wheat for treatment. The progress of the demonstration program in extending the use of copper carbonate is traced below:

Year	Number of demonstrations	Acres of grain treated with copper carbonate
1920	0	0
1921	88	125
1922	252	38,845
1923	14	305,075
1924	16	505,000
1925	0	650,000

*Forage crop improvement.* According to the 1919 United States census, there were 210,655 acres of alfalfa in Oregon. At that time, not over 5 percent of it was Grimm. Results at all of the experiment stations in this state showed that on at least 75 percent of the alfalfa area Grimm will outyield common alfalfa from one-half to a ton and one-half per acre.

It is estimated that there are now at least 20,000 acres of Grimm alfalfa in the state. This increase of 100 percent since the year 1919 can be traced largely to the extensive demonstrations arranged by county agents to show the increased yields possible from the introduction of Grimm seed. This phase of the farm crops project is summarized below:

#### POUNDS OF GRIMM ALFALFA SEED SOLD SINCE 1919

Year	Number of demonstrations	Number of counties	Pounds of seed sold
1920	0	5	9,618
1921	60	6	6,931
1922	81	6	10,217
1923	164	10	70,675
1924	318	17	65,250
1925	521	21	68,185

Expansion of the alfalfa acreage in the Willamette Valley is typified by the increase in the number of farmers growing that crop in Washington county during the past three years. In 1923, only 36 farmers grew alfalfa there. Another 127 farmers planted it in 1924, and in 1925 the number of growers has increased to 419. Until recent years alfalfa was not grown at all in the Willamette Valley except by widely scattered farmers with exceptionally favorable soil conditions.

(g) *Soil fertility.* The Experiment Station made the announcement in 1916 that sulfur as a fertilizer would greatly increase the yield of

alfalfa. At that time, no sulfur was being used as an alfalfa fertilizer in Oregon.

In 1917, the Extension Service took up the work of establishing this practice and thereby building up the fertility on the thousands of acres of alfalfa in the state. Spread of the use of sulfur is indicated in a tabulation showing the increased interest in this demonstration program.

Year	Number of demonstra- tions	Counties concerned	Acres sul- fured
1917	10	4	-----
1918	25	5	3,000
1920	250	9	21,100

In 1923, 565 farmers in 6 counties pooled orders for 924 tons of sulfur.

In 1925, a survey made by county agents showed that 938 tons of sulfur and 515 tons of gypsum were used on 31,000 acres of alfalfa. This brought the total number of acres that had been sulfured since 1916 to 139,100. Each acre sulfured would show an increased yield of one ton for a period of two to three years. Allowing an increase of 1 ton per acre for 2 years, the increased yield of alfalfa hay would be 278,200 tons. The value of this crop at \$10,000 per ton would be \$2,782,000. This is the aggregate result of less than ten years of Extension work in this one phase of soil fertility.\*

(h) **Poultry husbandry.** Development of commercial poultry keeping in recent years has changed Oregon from an egg importing state to one that each year has a large surplus of eggs to sell. Income from the sale of Oregon eggs is now approximately \$10,000,000 annually.

High prices for poultry products during the World war stimulated the poultry industry, which had already reached considerable proportions as a result of favorable conditions found in this state and the breeding work done by Professor James Dryden at the College Experiment Station.

Post war deflation caused many to engage in poultry raising because it was one of the few agricultural enterprises which proved profitable during that period. The result, as stated by H. E. Cosby, poultry specialist for the Extension Service, "was unsound development propaganda, lack of uniformity, mass production, and mismanagement." The industry ran wild and poultrymen were facing disaster after a short term of prosperity.

It was at about that time, 1920, that a full-time Extension poultry specialist was employed. Since then, poultry Extension work has been designed to encourage adoption of management, production, and marketing practices known to be essential to profitable poultry keeping. The program has held certain major objectives in view, including:

Rearing of strong, healthy, well matured pullets.

Development of side line flocks of not less than 400 hens and at least 1,000 hens for commercial flocks.

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\*Annual present gains from use of sulfur on alfalfa lands in Southern and Eastern Oregon, as estimated by the Experiment Station, are given as \$180,000 in the Experiment Station report under Soils, Irrigation and Drainage.

A minimum of 10 acres of tillable land for commercial flocks.  
Cooperative marketing of eggs.

During the years 1921 to 1924, inclusive, activities associated with those objectives were largely conducted through poultry demonstration farms established in principal poultry areas of the state. Owners of these farms agreed to follow practices outlined by the Extension specialist. Four public meetings were held on each farm during the year to discuss seasonal operations. The average number of these farms during the four-year period was 50.

Outstanding accomplishments in line with the objectives of poultry Extension work are:

Cessation of commercial poultry development on small acreage tracts.

Eighty percent of the commercial poultrymen brooding 500 or more chicks now use portable brooding houses, alternate brooding yards, or yards paved with concrete to avoid diseases resulting from soil contamination.

Seventy percent of the commercial poultrymen are moving their pullets to free range on new soil after the 8 to 10 week brooding period.

The cooperative egg marketing association is on a sound basis and has grown in membership and volume of eggs handled.

Substantial increase has been noted in the number of 400 hen side-line flocks. For instance, during two weeks work in eight counties, the poultry Extension specialist counted from the highways or railroads 34 new poultry houses. Of these, 19 were of the 400 unit type recommended by the College, 8 were half that size but so constructed as to permit additions, 7 were typical reflections of the builders' own ideas.

**Summary.** The activities mentioned under the foregoing headings—(a) to (h) inclusive—include examples of typical project work that revolves around the county agricultural agent. County agents used many means of carrying on their work. These are typified by the following summary taken from annual county agent reports for the years 1920 to 1925. (Figures are averages per county.)

	1920	1921	1922	1923	1924	1925
Office callers .....	1,021	1,247	1,427	1,781	1,800	2,100
Letters written .....	870	1,144	1,291	1,234	1,413	1,446
Farm visits .....	281	340	389	506	509	547
News articles written .....	107	108	118	110	-----	-----
Field demonstrations .....	-----	-----	76	107	135	166
Meetings at demonstrations .....	13	30	38	36	34	44



Typical of the information sought by callers at the offices of county agents is the list of those who called at the office of O. T. McWhorter, Washington county, in June, 1926.

Information or assistance sought on	Number callers
Poultry .....	2
Horticulture .....	28
Insect Pests and Diseases.....	50
Rodent .....	42
Dairy .....	7
Fertilizer .....	4
Farm Crops:	
Alfalfa .....	45
Potatoes .....	31
Flax .....	2
Corn .....	3
Miscellaneous .....	16

Information or assistance sought on	Number callers
Livestock .....	3
Agricultural Engineering .....	2
Fairs .....	2
Club work .....	2
Farm Bureau .....	3
Pyrotol .....	6
Miscellaneous .....	50
Total .....	298

Walter A. Holt, county agent in Clackamas county kept during a typical month a list of subjects on which he furnished information requested by letter, phone, or in person. The list follows:

1. Help for a community program.
2. Orders for blasting powder.
3. Bulletins on poultry.
4. How to make lime-sulfur spray.
5. Grafting and budding of trees.
6. Alfalfa growing.
7. Lime for sour soil.
8. Potato certification.
9. Bulletins on mint growing.
10. To get alfalfa seed.
11. How to make bordeaux mixture.
12. Fruit tree spray information.
13. How to prune berry bushes.
14. To get poison grain.
15. How to control garden slugs.
16. Use of fertilizer on timothy.
17. To diagnose apple tree diseases.
18. Buyer wanting dairy cows.
19. Vetch seed wanted.
20. Bulletins on asparagus.
22. Pruning of fruit trees.
23. Listing cattle for sale.
24. Asking about sweet clover.
25. Flax production.
26. Lime on alfalfa.
27. Cherry maggot control.
28. Bull registration blanks.
29. Potato seed treatment.
30. Soil fertilizers.
31. Seed potatoes for sale.
32. Pasture seed mixtures.
33. Walnut grafting.
34. Rations for swine.
35. Seed wheat wanted.
36. Pear planting.
37. Man wanting farm work.
38. Bulb inspections.
39. Quack grass eradication.
40. Gopher control.
41. Testing soil for acidity.
42. Milk goat management.
43. Treatment of flax seed.
44. Spraying for aphids.
45. Prices of strawberry plants.
46. Plans for dairy barns.
47. How to get farm loans.
48. Morning glory control.
49. How to control chicken pox in poultry.
50. To return borrowed battery for blasting.
51. Arranging for motion pictures.
52. To get alfalfa inoculant.
53. Listing strawberry plants for sale.
54. Plant inspections for shipment.
55. Questions about cow testing association.
56. Where to get baby chicks and hatching eggs.
57. To order certified Hannchen barley seed.
58. Advice on frost control through smudge pots.
59. Identification of potato diseases.
60. Arrange for meeting of sheep owners.
61. Requests for bulletins on many subjects. This office has a supply of 200 different bulletins for free distribution.
62. Strawberry inspection. This office inspects with no charge to grower.

## SLIDE AND FILM DISTRIBUTION

**Slide service.** Prior to 1920, no effort was made to supply a slide service for extension workers and rural organizations. In that year, 53 sets of slides were prepared or assembled and made available for distribution. These were shown before 3,194 people.



Since that time the slide service has not developed materially. Greater use of motion picture films is largely responsible for that condition.

#### DISTRIBUTION OF SLIDE SETS

	1920	1921	1922	1923	1924	1925	1926
Number sets available for distribution.....	53	50	51	53	54	55	46
Attendance at meetings....	3,194	3,023	5,260	9,456	2,465	1,933	8,190
Attendance use of automatic balopticon.....			295,000	316,250	227,000	140,000	50,000
Number of counties served.....	20	16	22	21	14	7	15
Number of towns served.....	61	24	29	56	23	9	72

The year 1925 shows a marked decrease in the use of slides because all sets that had not been revised by the respective subject matter specialists were withdrawn from circulation and usable syllabi prepared to accompany them.

**Film service.** The Extension Service has acted as a depository and distributing agent for College owned motion-picture films since 1920. In the year 1921, films loaned by the United States Department of Agriculture and other agencies were added to the library of available reels and were shown to 16,246 people. Motion-pictures proved popular with extension workers and the communities of the state. Their circulation has steadily increased.

#### DISTRIBUTION OF MOTION-PICTURE FILMS

	1921	1922	1923	1924	1925	1926
Number of films available.....	23	28	20	37	49	52
Total attendance.....	16,246	12,590	5,572	11,525	19,473	80,672
Number of counties served.....	7	23	10	19	15	16
Number of towns served.....	35	74	20	44	54	449

**Slides and motion-pictures aid in educational extension.** In July, 1923, the office of information and exhibits was created within the Extension Service. The slide and film service was assigned to that office, with provision made for development of the service. The film library was systematized and circulation of motion-picture reels stimulated.

Among the groups before which College slides or films have been shown are: parent-teacher associations, high schools, grade schools, granges, community clubs, chambers of commerce, and farmers unions. No charge is made except that the user pays transportation both ways.

Two motion projectors, two generators for same, and two portable stereopticons are owned by the Extension Service.

The aim has been to develop the use of films and slides as an aid to the accomplishment of the projects to which the Extension Service is committed.

#### RADIO ACTIVITIES

(a) **Use of radio as institutional activity begun in March, 1923.** Utilization of radio as a systematic means of carrying to the citizens of the state the services of many branches of the College dates from March 26, 1923, when, under the auspices of the Extension Service, informational lectures on timely agricultural subjects were broadcast weekly from the

College station, then operating under the call letters KFDJ, with an antenna input of 50 watts.

During the college years 1923-24 and 1924-25, 130 timely talks on agricultural and homemaking subjects were broadcast from KGW, the then 500-watt station of *The Morning Oregonian* at Portland.

(b) **Modern 500-watt station built in 1925.** Completion of a modern 500-watt station on the College campus in the fall of 1925 was the signal for an enlarged radio program by the Extension Service. Practically all schools and departments of the College contributed to the broadcasts.

(c) **Many branches of the College participate in programs.** Under the slogan "Science for Service," informational lectures and special features in many fields of applied science were scheduled on Monday, Wednesday, and Friday nights. The practical as well as the cultural aspects of campus activities were reflected in the programs, which, during that year, carried approximately 400 lectures by 116 different faculty members to the radio audience.

The following schools and departments were represented:

*Agriculture:* Agricultural Engineering, Animal Husbandry, Dairying, Farm Crops, Farm Management, Horticulture, Landscape Gardening, Poultry Husbandry, Soils.

*Basic Arts and Sciences:* Art, Bacteriology, Botany and Plant Pathology, English language and literature, Entomology, Zoology.

*Home Economics:* Household Administration, Household Art, Household Science.

*Commerce:* Economics and Sociology, Finance and Administration, Political Science.

*Engineering:* Electrical Engineering, Hydraulics and Irrigation Engineering, Mechanical Engineering, Mechanics and Materials.

*Mines.*

*Forestry.*

*Vocational Education.*

*The Library.*

*Physical Education for Women.*

Entertainment furnished by the College musical organizations and students of the Music departments was a regular feature of College broadcasts. Campus athletic contests were described to listeners as they occurred.

Late in the year 1925, the call letters of the College station were changed to KOAC.

(d) **Home study courses arranged.** Radio home study courses are being offered from KOAC for the first time beginning with the first term of the college year 1926-27. These courses are similar to correspondence study, except that no college credit is offered for them. The following courses are being broadcast: Seed Production, Poultry Farm Management, Basketball Theory and Practice, National Government. Enrollment in these courses has totaled 80. The home study

courses will be continued during the second and third terms of the college year.

Series of six or more lectures are also being broadcast on each of four subjects during the first term of 1926-27 under the heading of radio lecture courses. These are similar to the study courses except that no enrollment is accepted in them. The following subjects are included: Irrigation, Football Practice and Theory, Short Stories from Oregon History, Constructive Elements of Music—illustrated.

(e) **Continuing program features developed...** Many regular program features have been developed, aside from lectures by College faculty members. The 1926-27 schedule includes the following:

*Agricultural features:* Boys' and Girls' Club News, Timely Agricultural Topics, Market News Interpretations. *Other features:* Music Hour, Sports Review, Campus News, Business Digest, Book Chats, Engineering Lectures, Athletic Contests.

(f) **Distinctive field is filled by KOAC.** Emphasis in KOAC's programs is placed on those things in which the College is peculiarly fitted to serve the state which supports it. Oregon State Agricultural College is dedicated to education and service in the field of applied science. It is the special and distinctive aim of Radio Station KOAC to extend the benefits of this institution into the thousands of homes of the state equipped with radio receiving sets.

A few generations ago colleges were open only to the privileged few. Now the sons and daughters of people of all walks of life attend our higher institutions of learning. During the last half century we have witnessed the development of land-grant colleges, in which liberal and cultural education has been combined with training for the practical pursuits of life and for service to the state. The radio now breaks down the barriers of time and space and opens the way to extend immeasurably this type of teaching and of service. Without cost, without loss of time, within his own home, a citizen may select, from the programs presented, lectures and combinations of lectures, which relate to his personal problems and interest, and which, if closely followed, will contribute to his service and personal improvement.

The Oregon State Agricultural College embraces schools of Agriculture, Engineering, Commerce, Home Economics, Forestry, Mines, Pharmacy, Vocational Education, and Basic Arts and Sciences; the departments of Chemical Engineering, Industrial Journalism, Military Science and Tactics, Physical Education, and Music. Research and investigation are in progress under the Oregon Experiment Station at the College and at nine branch stations located in different parts of Oregon. A staff of Extension workers is engaged in carrying the services of the College to the people of the state. The campus is the scene of many student activities, of intercollegiate games and contests, of homecomings and rallies. Student musical organizations give frequent public performances. Speakers of national reputation appear before the students assembled periodically in convocation. Conventions of state-wide interest and importance often come to the College. Radio makes possible the broadcasting of many of the most vital elements of this campus life.



(g) **Favorable comments received.** An extensive and appreciative audience follows programs from KOAC. Typical comments from listeners follow:

"Just a few lines to tell you that we have been receiving your programs and enjoy them so much."—E. H. Margason, Shedd.

"We are listening in on all your programs and find them both entertaining and instructive. The only fault we can find is that they don't last long enough."—Mrs. Laura Bilyeu, Scio.

"We have been listening in to all of your programs and have enjoyed them very much."—R. C. McReynolds, Jefferson.

"We enjoy your programs very much."—N. C. Anderson, Independence.

"We listen in every Monday night and are getting a lot of valuable information for which we are thankful."—Claude Turnbow, Cornelius.

"O. A. C.'s station programs are good. The subject-matter is well made up. The variety is such that it brings much that is of interest and value to us.

"The athletic broadcasting is not so good as KGW. You don't give us enough of the game's or the rooster's 'atmosphere.' Why not put a mike in the stands or in the gym, and let us hear the roar of the crowd when the game is time out?"—Clarence Loy, Independence.

"We are enjoying the regular programs broadcast from KOAC, because of the educational value of the lectures, the entertainment, and campus news, as we regularly listen in since installing our radio this fall. Be assured of our appreciation of the good work and our wish for the continuance of the broadcasting of athletic events."—Claude Buchanan, Corvallis.

"I have been hearing your lectures over the radio for a long time now, and have spent a lot of time trying to figure some nice, formal letter to tell you what I think of the broadcasts. But writing, to me, is harder than harrowing, so I'll do it spontaneously.

"I honestly believe you are doing more good for the farmers than all the other agencies combined. The only way to help the farmer is to help him to help himself, which your 'Agricultural Situations' are doing."—Paul Winslow, Salem.

Respectfully submitted,

PAUL V. MARIS,  
Director of the Extension Service.



# REPORT OF THE TREASURER

To the Honorable Board of Regents,

Oregon Agricultural College,

Gentlemen: Herewith I submit my report for the biennium beginning July 1, 1924 and ending June 30, 1926. The vouchers and other evidences of payment are on file in the office of the Manager of the Business Office.

Yours respectfully,

B. F. IRVINE,  
Treasurer.

The Treasurer's Report presents the accounts of the institution on the basis of the fiscal year; that is, a year beginning with July 1 of one year and ending with June 30 of the next. The biennial period covered in this report, therefore, begins with July 1, 1924 and ends with June 30, 1926.

## DIVISION I. RESIDENT INSTRUCTION FUNDS

### STATE AND FEDERAL FUNDS

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 508,948.72	\$ 528,830.19
Appropriation—Millage Tax, Laws 1913		423,552.29	433,815.05
Appropriation—Millage Tax, Laws 1920		726,089.65	743,682.94
Morrill-Nelson Fund		50,000.00	50,000.00
Land Grant Interest Fund		12,084.63	11,820.42
Miscellaneous Receipts		97,758.15	83,353.05
Total June 30th		\$1,818,433.44	\$1,851,501.65
EXPENDITURES			
Salary	\$ 813,751.33	\$ 787,749.69	
Labor	154,280.18	130,991.58	
Fuel	9,887.14	6,108.55	
Office supplies	5,627.61	9,403.14	
Stationery	102.23	1,287.16	
Postage	3,925.06	4,761.62	
Telephone and telegraph	9,083.84	8,380.24	
Advertising		2,767.19	
Freight and express	3,119.73	1,739.68	
Light and power	11,283.00	11,926.50	
Water	5,875.05	8,072.99	
Chemicals	169.92	1,520.73	
Seeds, plants, and supplies	65,660.45	38,623.60	
Fertilizer	11.95	92.91	
Feeding stuffs	9,176.70	267.10	
Rents	2,278.50	56.75	
Contingent	817.92	827.14	
Publications and printing	6,917.38	9,993.26	
Travel	11,221.07	11,338.40	
Repairs	28,137.62	7,322.17	
Furniture and fixtures	10,524.55	6,817.76	
Scientific apparatus	12,812.59	9,040.89	
Tools and machinery	9,782.79	7,003.97	
Books, periodicals, etc.	15,662.67	15,476.60	
Livestock	78.00		
Improvements	25,182.97	16,600.57	
Pharmacy Building	74,233.00		
Horse Barn		1,536.35	
Women's Building		236,614.39	
Additional lands		30,108.00	
State 1925 restoration apportionment		6,005.78	
Total	\$1,289,603.25	\$1,372,434.71	
Balance June 30	528,830.19	479,066.94	

# TREASURER

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## MISCELLANEOUS FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....		\$ 56,700.97	\$ 36,347.12
Receipts .....		82,314.69	89,686.94
Total .....		\$ 139,015.66	\$ 126,034.06
EXPENDITURES			
Salary .....	\$	9,758.75	\$ 443.50
Labor .....		897.54	360.73
Office supplies .....		10,765.56	6,996.86
Stationery .....		1,332.55	419.44
Postage .....		28.39	3.00
Telephone and telegraph .....		91.40	123.00
Freight and express .....		172.99	15.39
Light and power .....		1,118.10	862.38
Fuel .....		1,027.12	646.37
Chemical supplies .....		134.86	159.10
Seeds, plants, and supplies .....		17,604.50	1,934.45
Publications and printing .....		22,676.87	12,392.07
Commencement .....		467.00	230.00
Contingent .....		384.05	
Travel .....		798.55	841.80
Repairs .....		13,915.10	12,188.56
Furniture and fixtures .....		2,048.75	2,777.59
Tools and machinery .....		1,432.42	872.71
Books and magazines .....		1,553.51	1,646.21
Rents .....		111.52	220.00
Laundry .....		308.99	504.87
Scientific apparatus .....		333.23	1,086.50
Livestock .....		1.20	92.00
Advertising .....		197.11	858.54
Miscellaneous .....			536.29
Improvements .....		15,508.48	3,429.00
Total .....	\$	102,668.54	\$ 49,637.36
Balance June 30 .....		36,347.12	76,396.70

## DIVISION II. AGRICULTURAL EXPERIMENT STATION

### HOME STATION

#### ADAMS FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Appropriation .....	\$	15,000.00	\$ 15,000.00
EXPENDITURES			
Salary .....	\$	13,650.01	\$ 13,709.99
Labor .....		647.36	583.82
Stationery and office supplies .....		14.11	10.96
Chemical and laboratory supplies .....		467.03	386.63
Feeding stuffs .....		18.10	28.00
Contingent .....		37.62	51.63
Postage .....		4.00	
Freight and express .....		46.46	26.96
Fuel and gas .....		56.97	27.95
Books, periodicals, etc. ....		3.00	5.00
Tools and machinery .....		55.34	5.55
Fertilizer .....			35.21
Telephone and telegraph .....			.65
Travel .....			7.35
Furniture and fixtures .....			9.50
Scientific apparatus .....			110.80
Total .....	\$	15,000.00	\$ 15,000.00
Balance June 30 .....			

## OREGON AGRICULTURAL COLLEGE

## HATCH FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Appropriation .....		\$ 15,000.00	\$ 15,000.00
EXPENDITURES			
Salary .....	\$	10,884.17	\$ 9,558.00
Labor .....		2,168.46	2,832.13
Stationery and office supplies .....		3.46	49.26
Chemical and laboratory supplies .....		130.84	85.24
Feeding stuffs .....		193.67	177.00
Contingent .....		197.37	
Sundry .....			217.51
Fertilizer .....		128.50	5.65
Postage .....		2.67	
Travel .....		753.47	788.25
Freight and express .....		7.89	1.26
Publications .....		481.71	994.98
Fuel .....		8.35	
Furniture and fixtures .....		18.40	120.25
Library .....		2.00	
Tools and machinery .....		19.04	40.66
Telephone and telegraph .....			5.33
Scientific apparatus .....			124.48
Total .....			
Balance June 30 .....	\$	15,000.00	\$ 15,000.00

## PURNELL FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Appropriation .....			\$ 20,000.00
EXPENDITURES			
Salary .....	\$		\$ 12,150.00
Labor .....			1,389.53
Office supplies .....			138.55
Chemical supplies .....			370.41
Sundry supplies .....			425.00
Fertilizer .....			2.00
Telephone and telegraph .....			14.78
Postage .....			15.38
Travel .....			2,961.88
Freight and express .....			70.00
Printing .....			398.35
Fuel .....			5.77
Scientific apparatus .....			188.02
Furniture and fixtures .....			993.21
Tools and machinery .....			877.12
Total .....			
Balance June 30 .....	\$		\$ 20,000.00

## AGRICULTURAL INVESTIGATION FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	5,129.55	\$ 4,036.95
Appropriation .....		25,000.00	25,000.00
Total .....	\$	30,129.55	\$ 29,036.95
EXPENDITURES			
Salary .....	\$	21,006.23	\$ 20,317.00
Labor .....		1,358.97	2,747.56
Office supplies .....		103.56	190.54
Stationery .....		12.60	

## TREASURER

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Postage .....	22.63	47.39
Telephone and telegraph .....	113.91	125.66
Freight and express .....	67.54	129.00
Light and power .....	3.00	
Chemical supplies .....	362.17	352.01
Seeds, plants, etc. ....	348.33	761.93
Feeding stuffs .....	305.91	38.57
Rents .....	281.50	
Contingent .....	109.50	3.00
Small printing .....	440.59	1,214.72
Travel .....	616.66	1,196.78
Repairs .....	206.50	
Furniture and fixtures .....	211.36	93.23
Scientific apparatus .....	45.14	48.99
Tools and machinery .....	300.95	217.68
Fuel .....	115.55	7.22
Total .....	\$ 26,092.60	\$ 27,491.28
Balance June 30 .....	4,036.95	1,545.67

## CROP PEST FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	1,393.56	\$ 4,710.63
Appropriation .....		15,000.00	15,000.00
Total .....	\$	16,393.56	\$ 19,710.63

## EXPENDITURES

Salary .....	\$ 7,636.65	\$ 9,595.00
Labor .....	1,007.49	1,959.25
Office supplies .....	25.46	88.46
Telephone and telegraph .....	8.92	34.83
Freight and express .....	37.77	52.82
Chemical supplies .....	114.65	400.35
Seeds, plants, etc. ....	348.55	607.95
Fertilizer .....	.75	4.45
Contingent .....	12.12	
Publications and printing .....	1,229.84	1,885.59
Travel .....	1,159.14	1,631.06
Repairs .....	3.86	
Furniture and fixtures .....	60.14	6.92
Scientific apparatus .....	7.50	93.39
Tools and machinery .....	11.32	501.39
Books .....	5.60	5.13
Postage .....		1.55
Fuel .....		18.47
Rents .....		96.90
Balance 1922 appropriation .....	13.17	
Total .....	\$ 11,682.93	\$ 16,983.51
Balance June 30 .....	4,710.63	2,727.12

## DAIRY INVESTIGATIONS FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	1,607.47	\$ 2,217.29
Appropriation .....		8,750.00	10,000.00
Total .....	\$	10,357.47	\$ 12,217.29

## EXPENDITURES

Salary .....	\$ 3,971.16	\$ 3,794.00
Labor .....	2,513.65	3,198.57
Freight and express .....	97.68	155.34
Chemical supplies .....	13.66	180.23
Seeds, plants, etc. ....	30.45	176.26
Feeding stuffs .....	883.82	1,422.15
Rents .....	450.00	605.00
Travel .....	172.26	549.28
Contingent .....	7.50	



Office supplies .....		25.26
Stationery .....		18.07
Postage .....		4.16
Telephone and telegraph .....		9.24
Laundry .....		16.12
Water .....		40.95
Fuel .....		33.80
Printing .....		21.00
Total .....	\$	8,140.18
Balance June 30 .....	\$	2,217.29
		\$ 10,249.43
		1,967.86

## SOILS INVESTIGATIONS FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	1,300.66	\$ 1,158.87
Appropriation .....		7,500.00	7,500.00
Total .....	\$	8,800.66	\$ 8,658.87

## EXPENDITURES

Salary .....	\$	3,810.42	\$ 3,818.75
Labor .....		1,591.79	2,251.82
Office supplies .....		17.20	22.77
Telephone and telegraph .....		.74	3.09
Freight and express .....		57.17	44.60
Light and power .....		19.12	22.17
Chemical supplies .....		82.84	46.23
Seeds, plants, etc. ....		409.52	310.52
Fertilizer .....		47.50	113.58
Rents .....		55.00	
Publications and printing .....		303.94	9.30
Travel .....		597.20	1,332.47
Repairs .....		266.21	186.25
Scientific apparatus .....		8.89	
Tools and machinery .....		359.75	
Contingent .....		14.50	44.70
Feeding stuffs .....			35.95
Total .....	\$	7,641.79	\$ 8,242.20
Balance June 30 .....		1,158.87	416.67

## POULTRY INVESTIGATION FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	2,500.00	\$ 2,500.00
Total .....	\$	2,500.00	\$ 7,500.00
Appropriation .....			5,000.00

## EXPENDITURES

Salary .....		\$ 2,782.08
Labor .....		232.80
Office supplies .....		13.02
Telephone and telegraph .....		16.19
Freight and express .....		84.14
Chemicals and laboratory supplies .....		649.18
Seeds, plants, and supplies .....		379.83
Feeding stuffs .....		51.61
Travel .....		19.75
Furniture and fixtures .....		728.25
Scientific apparatus .....		124.00
Total .....		\$ 5,080.85
Balance June 30 .....	\$	2,500.00
		2,419.15

## BRANCH STATIONS

## EASTERN OREGON EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 34,943.50	\$ 35,287.36
Appropriation		7,500.00	7,500.00
Receipts		15,522.32	14,088.91
Total		\$ 57,965.82	\$ 56,876.27

## EXPENDITURES

Salary	\$ 14,547.16	\$ 15,014.01
Labor	973.25	
Office supplies	42.36	27.59
Stationery	14.29	14.31
Postage	25.00	21.62
Telephone	51.30	49.50
Telegraph	6.23	3.47
Freight and express	179.66	240.83
Light and power	66.55	66.40
Water	63.00	63.00
Fuel	7.05	
Chemicals and laboratory supplies	142.31	117.18
Seeds, plants, and supplies	1,522.96	1,641.88
Feeding stuffs	119.14	583.96
Rent	142.00	3.00
Printing		118.77
Travel	437.82	270.93
Repairs	75.76	364.72
Furniture and fixtures	65.30	30.00
Tools and machinery	42.71	565.05
Livestock	4,090.61	4,777.70
Contingent	54.50	31.00
Fertilizer		93.60
Improvements		435.89
Balance of 1922 appropriation—reverted to state	9.50	
Total	\$ 22,678.46	\$ 24,534.41
Balance June 30	35,287.36	32,341.86

## HARNEY COUNTY EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	170.84	\$ 249.33
Appropriation		8,000.00	8,000.00
Receipts		2,200.00	900.00
Total	\$	10,370.84	\$ 9,149.33

## EXPENDITURES

Salary	\$ 5,984.81	\$ 6,314.48
Labor	229.00	135.00
Office supplies	46.80	20.05
Stationery	3.50	11.27
Postage	5.50	40.42
Telephone and telegraph	39.60	50.21
Freight and express	171.01	142.94
Fuel	24.75	
Chemical and laboratory supplies	27.49	15.55
Seeds, plants, and supplies	917.78	1,448.73
Feeding stuffs	16.10	84.00
Rent	56.00	2.25

Travel .....	380.55	198.40
Repairs .....	39.80	54.42
Tools and machinery .....	1,996.47	276.38
Improvements .....	182.35	25.00
Miscellaneous .....		.84
Furniture and fixtures .....		285.32
Scientific apparatus .....		555.70
Total .....	\$ 10,121.51	\$ 9,660.96
Balance June 30 .....	249.33	—511.63

## UMATILLA EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	3,983.26	\$ 4,108.76
Appropriation .....		3,000.00	3,000.00
Receipts .....		3,744.09	2,965.22
Total .....	\$	10,727.35	\$ 10,073.98

## EXPENDITURES

Salary .....	\$ 2,683.16	\$ 2,533.85
Postage .....	6.00	11.31
Telephone .....	2.85	10.20
Telegraph .....	.70	
Freight and express .....	32.24	69.47
Chemicals and laboratory supplies .....	2.50	4.70
Seeds, plants, and supplies .....	1,049.14	293.17
Fertilizer .....	.75	
Feeding stuffs .....	288.84	603.86
Rent .....	50.00	
Travel .....	270.03	180.75
Repairs .....	16.15	11.20
Tools and machinery .....	40.75	5.00
Livestock .....	2,167.54	2,018.27
Contingent .....	7.94	162.68
Fuel .....		5.92
Printing .....		130.80
Improvement .....		4.50
Total .....	\$ 6,618.59	\$ 6,045.68
Balance June 30 .....	4,108.76	4,028.30

## SOUTHERN OREGON EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	4,624.42	\$ —1,156.22
Appropriation .....		12,000.00	12,000.00
Receipts .....		1,978.08	1,797.98
Total .....	\$	18,602.50	\$ 12,641.76

## EXPENDITURES

Salary .....	\$ 12,024.97	\$ 9,571.55
Office supplies .....	59.74	101.68
Postage .....	10.36	3.00
Telephone .....	103.07	123.96
Telegraph .....	4.65	1.48
Freight and express .....	238.35	123.22
Light and power .....	166.58	122.82
Fuel .....	35.00	
Chemicals and laboratory supplies .....	242.47	363.38
Seeds, plants, and supplies .....	2,861.03	1,531.29

Fertilizer inspection .....	151.09	196.01
Feeding stuffs .....	270.66	
Rent .....	160.00	150.00
Travel .....	171.55	171.03
Repairs .....	212.32	155.90
Tools and machinery .....	1,211.92	260.05
Books .....	55.41	
Improvements .....	1,352.76	
Stationery .....	12.36	
Miscellaneous .....	6.87	
Cuts and half-tones .....	263.81	
Scientific apparatus .....	143.75	
Livestock .....		8.00
Printing, etc. ....		837.00
Furniture and fixtures .....		76.20
Total .....	\$ 19,758.72	\$ 13,796.57
Balance June 30 .....	—1,156.22	—1,154.81

## MORO DRY FARM EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	2,382.80	\$ 1,627.77
Appropriation .....		6,000.00	6,000.00
Receipts .....		1,397.13	744.00
Total .....	\$	9,779.93	\$ 8,371.77

EXPENDITURES			
Salary .....	\$	6,240.68	\$ 7,186.23
Office supplies .....		15.99	7.60
Postage .....		4.10	3.64
Telephone and telegraph .....		42.70	88.45
Freight and express .....		44.47	81.57
Light and power .....		29.10	120.25
Water .....		91.40	106.24
Chemicals and laboratory supplies .....		14.02	8.75
Seeds and plants .....		580.82	724.15
Contingent .....		7.65	5.00
Travel .....		498.15	395.72
Repairs .....		132.89	45.70
Tools and machinery .....		417.01	198.53
Fuel .....		19.95	28.25
Feeding stuffs .....		9.36	
Furniture and fixtures .....			83.00
Balance of 1922 appropriation .....		3.87	
Total .....	\$	8,152.16	\$ 9,083.08
Balance June 30 .....		1,627.77	—711.31

## HOOD RIVER EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	1,333.26	\$ 3,085.15
Appropriation .....		10,500.00	12,000.00
Receipts .....		162.50	750.32
Total .....	\$	11,995.56	\$ 15,835.47

EXPENDITURES			
Salary .....	\$	7,301.66	\$ 8,831.67
Labor .....		19.20	124.66
Office supplies .....		79.19	134.76
Stationery .....		11.35	2.64
Postage .....		3.76	55.90
Telephone and telegraph .....		51.30	100.39
Freight and express .....		13.55	96.93
Light and power .....		11.40	28.05
Chemicals and laboratory supplies .....		14.90	103.65



Seeds, plants, etc. ....	170.07	1,813.29
Fertilizer .....	15.95	181.86
Feeding stuffs .....	3.00	224.58
Rents .....	459.00	402.00
Laundry .....	2.04	3.42
Small printing .....	68.44	29.70
Cuts and half-tones .....	14.21	
Travel .....	566.34	2,175.67
Repairs .....	29.05	186.12
Furniture and fixtures .....	9.00	
Books and periodicals .....	17.00	12.00
Contingent .....	50.00	2.00
Scientific apparatus .....		40.00
Tools and machinery .....		859.59
Livestock .....		125.00
Improvements .....		5.00
Total .....	\$ 8,910.41	\$ 15,538.88
Balance June 30 .....	3,085.15	296.59

## JOHN JACOB ASTOR EXPERIMENT STATION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	826.71	\$ 531.40
Appropriation .....		4,500.00	6,000.00
Receipts .....		2,597.20	2,276.18
Total .....	\$	7,923.91	\$ 8,807.58

## EXPENDITURES

Salary .....	\$ 5,421.30	\$ 5,302.94
Labor .....	54.40	424.11
Telephone and telegraph .....	2.63	32.77
Freight and express .....	85.65	50.52
Seeds, plants, etc. ....	241.99	262.74
Fertilizer .....	54.75	65.92
Feeding stuffs .....	994.87	806.23
Contingent .....	151.50	48.70
Small printing .....	11.50	10.73
Travel .....	199.32	220.79
Furniture and fixtures .....	27.62	30.00
Tools and machinery .....	78.88	587.23
Livestock .....	35.00	492.65
Repairs .....	33.10	118.15
Office supplies .....		12.96
Stationery .....		13.20
Postage .....		11.00
Water .....		240.90
Chemicals .....		61.56
Improvements .....		1,106.47
Total .....	\$ 7,392.51	\$ 9,899.57
Balance June 30 .....	531.40	—1,091.99

## DIVISION III. EXTENSION SERVICE

## STATE EDUCATIONAL EXTENSION FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	5,156.87	\$ 4,195.85
Appropriation .....		25,000.00	25,000.00
Total .....	\$	30,156.87	\$ 29,195.85

## EXPENDITURES

Salary .....	\$ 19,078.40	\$ 18,129.77
Labor .....	1,045.32	1,544.75
Supplies and materials .....	339.01	875.41
Telephone and telegraph .....	448.18	491.30
Postage .....	188.33	485.96
Travel .....	4,197.27	5,631.99
Freight and express .....	67.87	81.62
Printing .....	188.41	67.16
Furniture and fixtures .....	289.88	507.82
Library .....	3.85	9.35
Scientific equipment .....	10.37	.....
Tools, machinery, etc. ....	2.75	13.03
Contingent .....	101.29	89.36
Total .....	\$ 25,961.02	\$ 27,922.52
Balance June 30 .....	4,195.85	1,273.33

## COOPERATIVE FARM DEMONSTRATION FUND

July 1, 1924 to June 30, 1926

## INCOME

	1924-25	1925-26
Balance July 1 .....	\$ 6,219.21	\$ 1,444.43
Appropriation .....	15,000.00	15,000.00
Total .....	\$ 21,219.21	\$ 16,444.43

## EXPENDITURES

Salary .....	\$ 12,797.65	\$ 9,799.90
Labor .....	978.75	257.88
Supplies and materials .....	1,058.08	1,595.04
Telephone and telegraph .....	657.67	625.81
Postage .....	57.92	37.48
Travel .....	3,516.09	2,153.83
Freight and express .....	35.68	51.64
Printing, binding, and publications .....	576.08	7.94
Furniture and fixtures .....	32.59	8.91
Library .....	.50	.65
Scientific equipment .....	5.40	.....
Tools, machinery, etc. ....	19.00	1.00
Contingent .....	39.37	40.80
Total .....	\$ 19,774.78	\$ 14,580.88
Balance June 30 .....	1,444.43	1,863.55

## FEDERAL SMITH-LEVER FUND

July 1, 1924 to June 30, 1926

## INCOME

	1924-25	1925-26
Appropriation—Federal .....	\$ 51,224.89	\$ 51,224.89
Total .....	\$ 51,224.89	\$ 51,224.89

## EXPENDITURES

Salary .....	\$ 31,125.55	\$ 28,839.38
Labor .....	6.50	19.10
Stationery and office supplies .....	1,718.44	2,758.19
Telephone and telegraph .....	413.22	525.90
Postage .....	18.60	21.48
Travel .....	16,770.66	16,730.12
Freight and express .....	42.72	113.70
Printing .....	681.96	1,582.73
Furniture .....	241.87	501.73
Library .....	.62	5.00
Scientific .....	100.24	74.80
Tools .....	88.56	18.46
Contingent .....	15.95	34.25
Total .....	\$ 51,224.89	\$ 51,224.89
Balance June 30 .....	.....	.....

## STATE SMITH-LEVER FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	.....	\$ 11,893.55	\$ 15,650.31
Appropriation	.....	31,300.50	31,300.50
Total	.....	\$ 43,194.05	\$ 46,950.81
EXPENDITURES			
Salary	.....	\$ 27,543.74	\$ 31,300.38
Total	.....	\$ 27,543.74	\$ 31,300.38
Balance June 30	.....	15,650.31	15,650.43

## RODENT CONTROL FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	.....		\$ 945.98
Appropriation	.....	\$ 1,250.00	2,500.00
Total	.....	\$ 1,250.00	\$ 3,445.98
EXPENDITURES			
Travel	.....	\$ 304.02	\$ 1,204.07
Labor	.....		1,088.72
Supplies and material	.....		959.81
Telephone and telegraph	.....		16.28
Postage	.....		25.45
Freight and express	.....		7.66
Contingent	.....		1.00
Total	.....	\$ 304.02	\$ 3,302.99
Balance June 30	.....	945.98	142.99

## BAKER COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	.....	\$ 176.30	\$ 16.92
Appropriation	.....	5,000.00	5,000.00
Total	.....	\$ 5,176.30	\$ 5,016.92
EXPENDITURES			
Salary	.....	\$ 3,312.93	\$ 3,345.03
Labor	.....	7.00	.90
Stationery and office supplies	.....	360.59	215.62
Telephone and telegraph	.....	161.00	201.98
Postage	.....	34.39	25.00
Travel	.....	1,262.78	842.41
Freight and express	.....	3.39	9.69
Furniture and fixtures	.....	7.35	37.75
Contingent	.....	9.95	12.50
Library	.....		26.50
Tools and machinery	.....		3.00
Total	.....	\$ 5,159.38	\$ 4,720.38
Balance June 30	.....	16.92	296.54

## BENTON COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

## INCOME

	1924-25	1925-26
Balance July 1 .....	\$ 440.20	\$ 552.29
Receipts .....	121.14	15.84
Appropriations .....	4,850.00	3,425.00
Total .....	\$ 5,411.34	\$ 3,993.13

## EXPENDITURES

Salary .....	\$ 3,173.08	\$ 3,178.34
Labor .....	20.15	2.40
Stationery and office supplies .....	148.95	117.33
Telephone and telegraph .....	112.90	74.23
Postage .....	41.21	35.57
Travel .....	1,236.73	1,311.27
Freight and express .....	5.23	5.29
Furniture .....	93.75	.....
Scientific equipment .....	5.85	.....
Tools and machinery .....	17.55	.70
Printing, binding, and publications .....	2.50	1.52
Contingent .....	1.15	5.50
Library .....	.....	.15
Total .....	\$ 4,859.05	\$ 4,732.30
Balance June 30 .....	552.29	—739.17

## CLACKAMAS COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

## INCOME

	1924-25	1925-26
Balance July 1 .....	\$ 346.30	\$ —177.22
Receipts .....	256.63	.....
Appropriation .....	4,125.00	5,250.00
Total .....	\$ 4,727.93	\$ 5,072.78

## EXPENDITURES

Salary .....	\$ 3,422.50	\$ 3,965.48
Labor .....	1.75	1.25
Stationery and office supplies .....	103.73	128.05
Telephone and telegraph .....	138.95	139.09
Revolving .....	.....	300.00
Postage .....	10.29	40.50
Bona Premium .....	.....	5.00
Travel .....	764.44	729.17
Freight and express .....	7.29	4.44
Heat, light, power, and water .....	27.87	30.49
Furniture .....	133.08	30.90
Scientific equipment .....	260.00	11.25
Tools, machinery, etc. ....	10.25	16.65
Contingent .....	25.00	10.00
Library .....	.....	.98
Total .....	\$ 4,905.15	\$ 5,413.75
Balance June 30 .....	—177.22	—340.97

## CLATSOP COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

## INCOME

	1924-25	1925-26
Balance July 1 .....	\$ —28.39	\$ 235.40
Receipts .....	240.03	1.68
Appropriation .....	4,400.00	4,250.00
Total .....	\$ 4,611.64	\$ 4,487.08



## EXPENDITURES

Labor .....		\$	.50
Salary .....	\$ 3,070.00		3,107.00
Stationery and office supplies .....	110.55		145.49
Telephone and telegraph .....	106.07		135.70
Postage .....	65.62		6.00
Travel .....	700.27		979.40
Freight and express .....	24.78		13.30
Furniture and fixtures .....	28.00		5.40
Scientific apparatus .....	247.60		18.00
Tools and machinery .....	13.35		3.85
Contingent .....	10.00		5.00
Total .....	\$ 4,376.24	\$	4,419.64
Balance June 30 .....	235.40		67.44

## COLUMBIA COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	—335.18	\$ 193.92
Receipts .....		220.78	2.30
Appropriation .....		4,000.00	4,000.00
Total .....	\$	3,885.60	\$ 4,196.22

## EXPENDITURES

Salary .....	\$ 2,862.42	\$ 2,949.25
Labor .....	.25	42.50
Stationery and printing .....	105.29	194.62
Telephone and telegraph .....	85.38	98.11
Postage .....	24.25	30.60
Travel .....	549.07	647.69
Freight and express .....	2.74	4.46
Furniture and fixtures .....	60.03	73.90
Scientific apparatus .....	.25	
Tools and machinery .....	.50	2.19
Contingent .....	1.50	4.00
Total .....	\$ 3,691.68	\$ 4,047.32
Balance June 30 .....	193.92	148.90

## COOS COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....			\$ 190.99
Receipts .....			2.69
Appropriation .....	\$ 2,500.00		5,000.00
Total .....	\$ 2,500.00		\$ 5,193.68

## EXPENDITURES

Labor .....		\$ 8.50
Salary .....	\$ 1,004.83	3,394.50
Stationery and printing .....	42.96	115.39
Telephone and telegraph .....	29.14	67.50
Postage .....	.75	27.64
Travel .....	776.84	910.79
Freight and express .....	6.24	9.27
Furniture and fixtures .....	43.25	73.88
Tools and machinery .....	4.00	4.50
Library .....		1.75
Contingent .....	1.00	17.50
Revolving fund .....	400.00	
Total .....	\$ 2,309.01	\$ 4,631.22
Balance June 30 .....	190.99	562.46

# TREASURER

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## CROOK COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 315.98	\$ —618.36
Receipts		3.81	2.30
Appropriation		3,580.00	6,120.00
Total		\$ 3,899.79	\$ 5,503.94
EXPENDITURES			
Salary		\$ 3,240.00	\$ 3,317.20
Labor		5.00	
Stationery		226.90	146.17
Telephone and telegraph		73.32	85.60
Postage		22.68	26.30
Travel		814.63	1,355.57
Freight and express		10.67	4.81
Printing		68.75	
Furniture and fixtures		52.10	15.10
Scientific apparatus		.25	
Tools and machinery		3.25	2.75
Contingent		.60	4.00
Total		\$ 4,518.15	\$ 4,957.50
Balance June 30		—618.36	546.44

## DESCHUTES COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ —259.35	\$ —780.65
Receipts		3.66	3.28
Appropriation		3,562.50	5,650.00
Total		\$ 3,306.81	\$ 4,872.63
EXPENDITURES			
Salary		\$ 2,620.00	\$ 3,006.31
Labor		11.50	3.00
Stationery		82.99	157.62
Telephone and telegraph		86.58	104.64
Postage		18.34	27.85
Rent		123.10	160.50
Travel		908.20	1,479.22
Freight and express		2.75	27.18
Premium on surety bond			4.00
Heat, light, power, and water		17.25	36.50
Furniture and fixtures		144.75	14.25
Printing, binding, and publications		72.00	
Contingent			2.75
Tools and machinery			3.25
Total		\$ 4,087.46	\$ 5,027.07
Balance June 30		—780.65	—154.44

## DOUGLAS COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 1,360.60	\$ 1,247.96
Receipts		48.05	5.85
Appropriation		6,600.00	6,000.00
Total		\$ 8,008.65	\$ 7,253.81

## EXPENDITURES

Salary .....	\$ 4,691.49	\$ 4,748.80
Labor .....	9.15	
Stationery and printing .....	127.92	144.64
Telephone and telegraph .....	140.29	155.17
Postage .....	27.84	24.59
Travel .....	1,675.53	1,414.46
Freight and express .....	15.58	12.35
Furniture and fixtures .....	18.89	13.25
Scientific apparatus .....	45.25	20.00
Tools and machinery .....	8.75	17.00
Contingent .....		32.00
Total .....	\$ 6,760.69	\$ 6,582.26
Balance June 30 .....	1,247.96	671.55

## GILLIAM COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$ 903.69	\$	826.85
EXPENDITURES			
Refund to county .....	76.85		
Total .....	\$ 76.84		
Balance June 30 .....	826.85	\$	826.85

## GRANT COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....			\$ 481.73
Receipts .....			
Appropriation .....	2,100.00		4,200.00
Total .....	\$ 2,100.00	\$	4,681.73

## EXPENDITURES

Salary .....	\$ 792.14	\$ 2,441.00
Labor .....		4.75
Stationery and printing .....	19.21	61.51
Telephone and telegraph .....	21.81	92.99
Postage .....	2.20	6.10
Travel .....	207.72	1,460.18
Freight and express .....	2.16	6.22
Furniture and fixtures .....	124.78	3.00
Tools and machinery .....	2.25	1.75
Office rent .....	446.00	171.00
Heat, light, power, and water .....		2.80
Library .....		1.00
Bond premium .....		4.00
Total .....	\$ 1,618.27	\$ 4,256.30
Balance June 30 .....	481.73	425.43

## HARNEY COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$ 1,108.62	\$	554.31
Total .....	\$ 1,108.62	\$	554.31
EXPENDITURES			
Refund to county .....	\$ 554.31		
Total .....	\$ 554.31		
Balance June 30 .....	554.31		554.31

## JACKSON COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 402.69	\$ 583.99
Receipts		402.88	6.13
Appropriation		10,707.50	10,250.00
Total		\$ 11,513.07	\$ 10,840.12
EXPENDITURES			
Salary		\$ 7,529.16	\$ 6,539.95
Labor		2.00	3.00
Stationery		163.92	129.29
Telephone and telegraph		207.06	202.30
Postage		59.30	36.97
Travel		2,149.49	1,672.13
Freight and express		1.11	6.05
Printing, binding, and publications		216.98	12.25
Heat, light, power, and water		23.18	22.95
Furniture and fixtures		16.98	48.58
Library		5.55	10.05
Tools and machinery		2.00	18.60
Contingent		.50	59.67
Scientific apparatus			17.25
Premium on surety bond			9.91
Rent		551.85	420.00
Total		\$ 10,929.08	\$ 9,208.95
Balance June 30		583.99	1,631.17

## JOSEPHINE COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 426.41	\$ 17.64
Receipts		304.53	80.67
Appropriation		5,875.00	5,875.00
Total		\$ 6,605.94	\$ 5,973.31
EXPENDITURES			
Salary		\$ 4,047.24	\$ 4,318.75
Labor		20.10	8.50
Stationery		340.66	313.41
Telephone and telegraph		249.76	217.25
Postage		76.23	23.57
Travel		1,414.55	1,468.27
Freight and express		19.40	10.65
Printing, binding, and publications		210.00	12.25
Furniture and fixtures		124.84	6.75
Scientific apparatus		1.65	17.50
Tools and machinery		43.72	8.20
Contingent		1.35	30.52
Library			1.15
Rent		38.80	26.55
Total		\$ 6,588.30	\$ 6,463.32
Balance June 30		17.64	—490.01

## KLAMATH COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ .92	\$ 623.92
Receipts		8.81	7.00
Appropriation		8,538.78	7,718.50
Total		\$ 8,548.51	\$ 8,349.42



## EXPENDITURES

Salary .....	\$ 5,404.00	\$ 5,016.50
Stationery and printing .....	244.15	210.73
Telephone and telegraph .....	171.33	168.78
Postage .....	62.25	51.75
Travel .....	1,906.69	2,858.54
Freight and express .....	2.29	.08
Furniture and fixtures .....	124.23	
Tools and machinery .....	6.15	
Contingent .....	3.50	34.50
Library .....		3.90
Total .....	\$ 7,924.59	\$ 8,344.78
Balance June 30 .....	623.92	4.64

## LAKE COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	1,089.25	\$ 419.62
Receipts .....		2.20	3.55
Appropriation .....		4,200.00	4,200.00
Total .....	\$	5,291.45	\$ 4,623.17

## EXPENDITURES

Salary .....	\$ 3,280.00	\$ 3,155.97
Labor .....	1.50	35.00
Stationery and printing .....	131.54	175.94
Telephone and telegraph .....	92.65	82.39
Postage .....	42.00	22.80
Travel .....	1,296.73	787.67
Freight and express .....	6.91	32.54
Furniture and fixtures .....	20.06	69.95
Contingent .....	.50	4.00
Tools and machinery .....		1.50
Total .....	\$ 4,871.83	\$ 4,367.76
Balance June 30 .....	419.62	255.41

## LANE COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	8.08	\$ 158.02
Appropriation .....		2,800.00	6,150.00
Total .....	\$	2,808.08	\$ 6,308.02

## EXPENDITURES

Salary .....	\$ 1,252.88	\$ 4,326.45
Labor .....	2.50	3.50
Stationery and printing .....	91.75	188.30
Telephone and telegraph .....	42.23	136.92
Postage .....	3.60	5.01
Travel .....	482.54	2,039.59
Freight and express .....	4.03	5.60
Furniture and fixtures .....	56.53	31.00
Library .....	.50	1.00
Tools and machinery .....	1.50	
Contingent .....	12.00	7.00
Scientific apparatus .....		.75
Revolving fund .....	700.00	
Total .....	\$ 2,650.06	\$ 6,745.12
Balance June 30 .....	158.02	437.10

## LINCOLN COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	58.85	\$ 301.78
Receipts		4.76	
Appropriation		3,800.00	4,000.00
Total	\$	3,863.61	\$ 4,301.78
EXPENDITURES			
Salary	\$	2,418.00	\$ 2,695.00
Labor			6.35
Stationery		92.72	84.29
Telephone and telegraph		48.95	63.10
Postage		24.23	6.98
Travel		670.38	1,306.68
Freight and express		15.00	12.28
Printing		54.75	80.00
Heat, light, power, and water		1.15	7.76
Rent		120.00	145.00
Furniture and fixtures		85.58	35.89
Library		2.82	
Scientific apparatus		23.00	
Tools and machinery		5.25	6.50
Contingent			4.50
Total	\$	3,561.83	\$ 4,454.31
Balance June 30		301.78	—152.53

## LINN COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	460.14	\$ 491.45
Receipts		57.25	1.44
Total	\$	517.39	\$ 492.89
EXPENDITURES			
Labor	\$	5.50	
Stationery and supplies		2.25	
Freight and express		17.19	
Tools and machinery		1.00	
Total	\$	25.94	
Balance June 30		491.45	\$ 492.89

## MALHEUR COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	1,246.78	\$ 929.88
Receipts		9.75	601.72
Appropriation		6,635.00	5,495.00
Total	\$	7,891.53	\$ 7,026.60
EXPENDITURES			
Salary	\$	5,206.80	\$ 4,332.30
Labor		3.00	
Stationery and office supplies		212.70	319.00
Telephone and telegraph		193.57	209.42
Postage		74.67	77.13
Travel		1,148.98	1,236.50
Freight and express		3.98	2.06
Printing		75.00	
Furniture and fixtures		41.10	4.00
Tools and machinery		1.10	3.50
Contingent		.75	18.50
Total	\$	6,961.65	\$ 6,202.41
Balance June 30		929.88	824.19

## OREGON AGRICULTURAL COLLEGE

## MORROW COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 624.01	\$ —126.07
Receipts		56.40	1.98
Appropriation		4,350.00	4,450.00
Total		\$ 5,030.41	\$ 4,325.91
EXPENDITURES			
Salary		\$ 2,940.00	\$ 3,000.00
Labor			1.50
Stationery and office supplies		86.13	62.72
Telephone and telegraph		191.08	142.12
Postage		24.66	22.55
Rent		121.20	145.00
Travel		1,565.88	931.42
Freight and express		8.90	5.65
Printing		101.78	74.93
Heat, light, power, and water		45.30	48.95
Furniture and fixtures		1.25	
Scientific apparatus		26.50	
Tools and machinery		28.80	4.45
Contingent		15.00	4.00
Total		\$ 5,156.48	\$ 4,443.29
Balance June 30		—126.07	—117.38

## MULTNOMAH COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 172.04	\$ —248.87
Receipts		168.68	3.05
Appropriation		6,100.00	6,100.00
Total		\$ 6,440.72	\$ 5,854.18
EXPENDITURES			
Salary		\$ 4,790.40	\$ 4,178.60
Labor		1.00	16.50
Stationery and office supplies		149.95	87.62
Telephone and telegraph		92.27	115.30
Postage		28.90	13.39
Travel		1,356.28	1,316.95
Heat, light, power, and water		33.34	51.02
Furniture and fixtures		8.37	2.00
Tools and machinery		62.08	
Contingent			13.00
Freight and express			.88
Printing			10.40
Rent		167.00	150.00
Total		\$ 6,689.59	\$ 5,955.66
Balance June 30		—248.87	—101.48

## POLK COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 1,040.12	\$ 1,040.12
Appropriation			2,250.00
Total		\$ 1,040.12	\$ 3,290.12

## EXPENDITURES

Salary .....		\$ 1,441.22
Stationery and printing .....		61.00
Telephone and telegraph .....		29.40
Postage .....		5.85
Travel .....		684.07
Freight and express .....		2.61
Furniture and fixtures .....		38.00
Tools and machinery .....		2.50
Revolving fund .....		400.00
Premium on surety bonds .....		2.00
Total .....		\$ 2,666.65
Balance June 30 .....	\$ 1,040.12	623.47

## SHERMAN COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	570.63	\$ 570.63
Total .....	\$	570.63	\$ 570.63
Balance June 30 .....		570.63	570.63

## TILLAMOOK COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	—161.72	\$ —68.10
Receipts .....		69.07	
Appropriation .....		6,498.00	6,220.83
Total .....	\$	6,396.35	\$ 6,152.73
EXPENDITURES			
Labor .....			\$ 20.05
Salary .....		4,633.73	4,384.27
Stationery and office supplies .....		193.13	158.69
Telephone and telegraph .....		152.43	162.32
Postage .....		139.71	106.14
Travel .....		1,304.73	1,762.61
Furniture and fixtures .....		.50	151.50
Freight and express .....		.72	2.80
Scientific apparatus .....		24.30	
Tools and machinery .....		13.70	42.60
Contingent .....		1.50	12.00
Total .....	\$	6,464.45	\$ 6,802.98
Balance June 30 .....		—68.10	—650.25

## UMATILLA COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	163.53	\$ —118.22
Receipts .....		1.55	
Appropriation .....		6,000.00	6,000.00
Total .....	\$	6,165.08	\$ 5,881.78
EXPENDITURES			
Salary .....	\$	4,523.00	\$ 4,603.75
Labor .....			5.80
Stationery and office supplies .....		150.91	177.74
Telephone and telegraph .....		159.84	154.18
Postage .....		8.20	28.95
Travel .....		1,433.12	1,519.02
Freight and express .....		3.98	12.09
Tools and machinery .....		1.25	



Contingent .....	3.00	5.50
Furniture and fixtures .....		4.00
Scientific apparatus .....		.75
Revolving fund .....		300.00
Rent .....		10.00
Total .....	\$ 6,283.30	\$ 6,821.78
Balance June 30 .....	—118.22	—940.00

## UNION COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	258.83	\$ —199.73
Receipt .....		3.05	1.72
Appropriation .....		4,000.00	4,250.00
Total .....	\$	4,261.88	\$ 4,051.99

EXPENDITURES			
Salary .....	\$	3,180.00	\$ 2,987.50
Labor .....			10.50
Stationery .....		174.90	103.55
Telephone and telegraph .....		102.52	121.12
Postage .....		10.47	12.00
Travel .....		821.75	988.33
Freight and express .....		1.49	
Printing .....		120.95	
Furniture and fixtures .....		48.03	.65
Tools and machinery .....		1.50	
Scientific apparatus .....			18.75
Contingent .....			19.00
Total .....	\$	4,461.61	\$ 4,261.40
Balance June 30 .....		—199.73	—209.41

## WALLOWA COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....	\$	645.65	\$ 645.65
Total .....	\$	645.65	\$ 645.65
Balance June 30 .....		645.65	645.65

## WASCO COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balances July 1 .....	\$	754.01	\$ 171.19
Receipts .....		75.37	2.00
Appropriation .....		4,100.00	4,100.00
Total .....	\$	4,929.38	\$ 4,273.19

EXPENDITURES			
Salary .....	\$	2,794.56	\$ 2,789.90
Labor .....		15.00	1.50
Stationery .....		102.74	64.38
Telephone and telegraph .....		161.54	133.13
Postage .....		37.80	13.13
Travel .....		1,476.34	533.73
Freight and express .....		2.98	14.68
Printing .....		127.63	131.62
Furniture and fixtures .....		25.50	
Scientific apparatus .....		.60	
Tools and machinery .....		9.50	
Contingent .....		4.00	33.25
Library .....			3.90
Total .....	\$	4,758.19	\$ 3,719.22
Balance June 30 .....		171.19	553.97

## WASHINGTON COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	—244.02	\$ —275.81
Receipts		176.06	15.42
Appropriation		4,000.00	4,100.00
Total	\$	3,932.04	\$ 3,839.61
EXPENDITURES			
Salary	\$	3,141.40	\$ 2,773.78
Labor		13.75	16.10
Stationery		138.14	130.49
Telephone and telegraph		120.94	98.55
Postage		36.19	64.59
Travel		461.96	988.85
Freight and express		24.40	5.80
Printing		5.40	155.10
Rent			56.00
Heat, light, power, and water		.95	.80
Furniture and fixtures		214.52	97.75
Tools and machinery		16.20	8.55
Contingent		34.00	9.50
Total	\$	4,207.85	\$ 4,405.86
Balance June 30		—275.81	—566.25

## WHEELER COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	937.44	\$ 937.44
Total	\$	937.44	\$ 937.44
Balance June 30		937.44	937.44

## YAMHILL COUNTY AGRICULTURIST

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	230.93	\$ 115.47
Total	\$	230.93	\$ 115.47
EXPENDITURES			
Refunded to county		115.46	
Total	\$	115.46	
Balance June 30	\$	115.47	\$ 115.47

## DIVISION IV. MISCELLANEOUS

## DORMITORIES FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1	\$	15,566.71	\$ 25,923.97
Receipts		129,694.43	136,947.41
Total	\$	145,261.14	\$ 162,871.38
EXPENDITURES			
Food	\$	56,091.93	\$ 53,993.00
Salary		8,525.00	9,146.44
Labor		26,645.27	35,707.39
Heat, light, and water		13,799.15	13,966.41

Freight and express .....	659.26	377.65
Telephone and telegraph .....	555.10	644.51
Postage and small printing .....	194.63	108.18
Supplies .....	1,121.45	1,796.54
Laundry .....	1,704.42	2,007.23
Travel .....	8.20	16.05
Replacement and repairs .....	8,181.95	13,166.16
Equipment .....	408.62	1,474.00
Rents .....	3.00	6.00
Miscellaneous .....	486.58	769.03
Total expenditures .....	\$ 118,384.56	\$ 133,178.59
Refunds .....	952.61	556.43
Total .....	\$ 119,337.17	\$ 133,735.02
Balance June 30 .....	25,923.97	29,136.36

## MEN'S DORMITORY

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....		\$ 1,218.68	\$ 2,221.95
Receipts .....		5,184.50	5,469.25
Total .....		\$ 6,403.18	\$ 7,691.20
EXPENDITURES			
Labor .....	\$	871.28	\$ 1,629.96
Supplies .....		150.73	123.22
Heat, light, and water .....		1,288.72	3,627.23
Freight and express .....		52.50	
Laundry .....		20.60	20.10
Improvement and repairs .....		327.91	1,123.15
Equipment .....		1,469.49	
Total .....		\$ 4,181.23	\$ 6,523.66
Balance June 30 .....		2,221.95	1,167.54

## FEES AND RECEIPTS FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1 .....		\$ 50,121.27	\$ 44,550.89
Receipts .....		77,881.90	88,240.33
Total .....		\$ 128,003.17	\$ 132,791.22
EXPENDITURES			
Salary .....	\$	5,741.04	\$ 4,815.00
Labor .....		12,280.19	12,145.40
Office supplies .....		5,694.69	6,884.20
Stationery .....		227.87	255.94
Postage .....		175.13	152.00
Telephone and telegraph .....		160.72	186.86
Freight and express .....		1,930.59	885.38
Light and power .....		1,266.78	1,332.77
Fuel .....		1,586.66	2,826.57
Chemical supplies .....		21,503.54	15,766.28
Seeds, plants, etc. ....		20,788.22	19,744.54
Publications and printing .....		645.67	534.35
Rent .....		4.50	76.04
Laundry .....		1,474.07	1,145.60
Contingent .....		1,027.63	599.45
Travel .....		347.03	782.18
Repairs .....		1,716.11	632.17
Furniture and fixtures .....		1,636.80	4,006.68
Scientific apparatus .....		339.52	1,978.83
Tools and machinery .....		4,497.65	398.80
Books, magazines, and periodicals .....		388.58	294.32
Improvements .....			845.11
Feeding stuffs .....		19.29	29.20
Total .....		\$ 83,452.28	\$ 76,317.67
Balance June 30 .....		44,550.89	56,473.55

## TREASURER

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## STANDARD BABCOCK GLASSWARE FUND

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ 232.53	\$ 253.34
Receipts		193.14	207.73
Total		\$ 425.67	\$ 461.07
EXPENDITURES			
Labor		\$ 29.80	\$ 70.60
Supplies		67.32	76.83
Freight and express		29.64	10.25
Travel		45.57	187.20
Postage			6.77
Supplies			1.00
Chemicals			12.85
Total		\$ 172.33	\$ 365.50
Balance June 30		253.34	95.57

## O. A. C. CREAMERY

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Balance July 1		\$ —833.98	\$ —8,882.24
Sales and receipts		67,388.48	71,389.19
Total		\$ 66,554.50	\$ 62,506.95
EXPENDITURES			
Salary		\$ 2,300.00	\$ 2,712.58
Labor		2,751.54	2,709.90
Butterfat		46,447.52	55,538.53
Creamery supplies		4,818.00	3,711.75
Office supplies, postage, telephone, and telegraph		134.78	146.31
Transportation		3,009.46	2,533.16
Heat, light, and power		687.43	1,450.74
Equipment, improvement, and repairs		2,682.98	3,116.96
Miscellaneous		1,664.76	1,957.08
Transferred to college funds		4,625.00	2,585.00
Transferred to college funds		6,315.27	
Total		\$ 75,436.74	\$ 76,462.01
Balance June 30		—8,882.24	—13,955.06

## O. A. C. PRESS

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Receipts			\$ 38,015.66
EXPENDITURES			
Salary and labor			\$ 19,321.05
Office supplies			43.15
Telephone and telegraph			102.05
Freight and express			183.75
Light and power			161.52
Supplies			521.43
Stock			16,715.40
Machinery			9,003.10
Repairs			325.05
Total			\$ 46,376.50
Balance June 30			—8,360.84



## STUDENT LOAN FUND

July 1, 1924 to June 30, 1926

ASSETS		1924-25	1925-26
Cash on hand .....	\$	1,866.06	\$ 1,060.82
Loans to men .....		26,403.38	27,316.83
Loans to women .....		4,660.38	5,179.10
Expense account .....		1,290.53	1,635.02
Furniture and fixtures .....		593.15	764.61
Total .....	\$	34,813.50	\$ 35,956.42
LIABILITIES			
General Fund .....	\$	26,154.34	\$ 29,472.97
Benson Fund .....		2,000.00	2,000.00
Interest .....		1,240.54	1,501.81
Donations .....		19.12	114.14
Late registration .....		2,854.00	2,395.00
Transcripts and change slips .....		495.50	472.50
Notes payable .....		2,050.00	
Total .....	\$	34,813.50	\$ 35,956.42

## DIVISION V. SPECIAL APPROPRIATIONS

## HORSE BARN RECONSTRUCTION

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Appropriation Chapter 367 Laws 1925 .....	\$	15,237.50	\$ 5,127.94
EXPENDITURES			
Labor .....	\$	128.25	
Seeds, plants, etc. ....		193.87	542.01
Feeding stuffs .....		907.67	779.86
Furniture and fixtures .....		6.45	62.09
Tools and machinery .....		90.20	222.05
Miscellaneous .....		220.47	602.51
Improvements .....		8,562.65	
Freight and express .....			21.75
Material .....			276.42
Building .....			45.64
Contract .....			1,825.00
Wiring contract .....			46.35
Total .....	\$	10,109.56	\$ 4,423.68
Balance June 30 .....		5,127.94	704.26

## RESTORATION OF SCIENCE HALL

Damaged by fire—December 16, 1925

July 1, 1924 to June 30, 1926

INCOME		1924-25	1925-26
Appropriation by State Board of Control, Laws of 1925, Chapter 170 .....			\$ 25,000.00
EXPENDITURES			
Salary and wages .....			\$ 7,859.35
Office supplies .....			88.62
Telephone and telegraph .....			1.30
Freight and express .....			29.67
Chemicals and laboratory supplies .....			6,800.91
Seeds, plants, and supplies .....			3,022.73
Furniture and fixtures .....			1,337.15
Scientific apparatus .....			981.28
Tools and machinery .....			35.46
Repairs .....			85.03
Total .....			\$ 20,241.50
Balance June 30 .....			4,758.50









## **Oregon Agricultural College Bulletin**

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UNIVERSITY OF ILLINOIS-URBANA



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